

Amber Waves contents

JUNE 2005 • VOLUME 3 • ISSUE 3

Economic Research Service/USDA



12



18



26



34

FINDINGS

2 MARKETS AND TRADE

U.S. Fruit and Vegetable Imports Outpace Exports
Future of Preferential Trade Programs Concerns
Developing Countries
China's New Farm Policies Have Modest Impact

4 DIET AND HEALTH

Companies Continue To Offer New Foods
Targeted to Children
After Leaving Welfare: Food Stamps or Not?

6 FARMS, FIRMS, AND HOUSEHOLDS

Ag Productivity Drives Output Growth
Production Shifting to Very Large Family Farms
Ag Biotech Patents on the Move

8 RURAL AMERICA

Rural America as a Retirement Destination
Most Low Education Counties Are in the
Nonmetro South

10 DATA FEATURE

Milestones in U.S. Farming and Farm Policy

42 INDICATORS

Selected statistics on agriculture and trade,
diet and health, natural resources, and
rural America

46 GLEANINGS

Snapshots of recent events at ERS, highlights
of new publications, and previews of research
in the works

48 PROFILES

Recent accolades for ERS staff

FEATURES

12 Will 2005 Be the Year of the Whole Grain?

Jean Buzby, Hodan Farah, and Gary Vocke

18 North America Moves Toward One Market

Steven Zahniser

26 Obesity Policy and the Law of Unintended Consequences

Fred Kuchler, Elise Golan, Jayachandran N. Variyam,
and Stephen R. Crutchfield

34 Why Hasn't Crop Insurance Eliminated Disaster Assistance?

Robert Dismukes and Joseph Glauber

U.S. Fruit and Vegetable Imports Outpace Exports

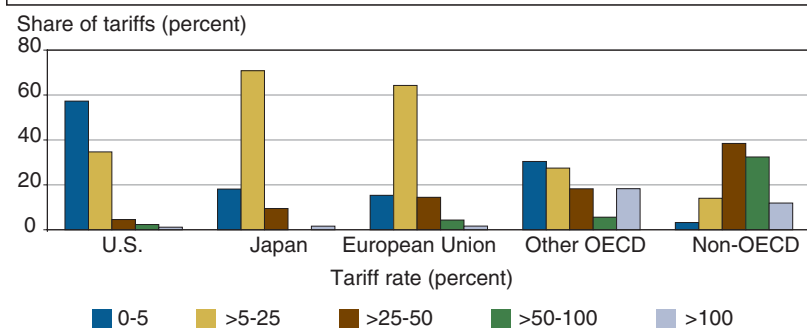
The U.S., traditionally a net exporter of fruits and vegetables, has become a large net importer, with imports more than doubling between 1994 and 2004 to reach \$12.7 billion. U.S. exports of fruits and vegetables have also risen but less rapidly, reaching \$9.7 billion in 2004. The surge in imports can be traced to a growing consumer demand for produce from tropical regions, produce that complements U.S. seasonal patterns of production, and produce that competes directly with U.S. production. Because of geographic proximity and low or zero tariffs, Canada and Mexico are among the largest sources and destinations of U.S. trade of fruits and vegetables.

U.S. produce exports are growing more slowly than imports partly because they are constrained by high tariffs and slow economic growth in importing countries. The global average tariff for the fruit and vegetable sector is over 50 percent, with tariffs varying substan-

tially across products and countries. In general, the United States maintains lower tariffs than most of its trading partners. Nearly 60 percent of U.S. tariffs on produce are less than 5 percent, and over 90 percent are under 25 percent. Countries belonging to the Organisation for Economic Co-operation and Development (OECD), which together import about 85 percent of the value of world fruit and vegetable trade, are characterized by a relatively large number of low tariffs and a small number of very high tariffs. For example, most Japanese and European Union fruit and vegetable tariffs range from 5 to 25 percent. In contrast, over half of all official tariffs of non-OECD countries exceed 25 percent, although in practice, non-OECD developing countries tend to maintain lower tariffs.

Market forces and government policies also are key factors shaping U.S. fruit and vegetable trade. The recent decline in the dollar—down about 11.6 percent in real terms since 2002 against a basket of horticultural trading partners—has made American fruits and vegetables relatively less expensive than those of most U.S. competitors in importing countries. The main exception is China, which has maintained a fixed exchange rate with the dollar, and China's horticultural products have begun to compete head-on with U.S. products in important third-country markets such as Japan. Partly in response to growing international competition, in December 2004, Congress passed the Specialty Crops Competitiveness Act, which (although not currently funded) authorizes promotional campaigns and technical and financial assistance designed to enhance the competitiveness of U.S. fruits and vegetables. Additionally, ongoing World Trade Organization

Nearly 60 percent of U.S. tariffs on produce are less than 5 percent



Note: Other OECD members include Australia, Canada, Iceland, South Korea, Mexico, New Zealand, Norway, Switzerland, and Turkey.

Future of Preferential Trade Programs Concerns Developing Countries

Both the United States and the European Union (EU) began providing trade preferences to developing countries in the early 1970s. These trade preferences, which reduce tariffs for designated products from eligible countries, are "nonreciprocal," meaning that they are granted unilaterally with beneficiaries not required to reciprocate with lower tariffs for donor country exports. The purpose of these programs is to foster economic development, particularly in the poorest countries, through increased trade. Ongoing trade negotiations, however, are creating uncertainty about the future of these programs.

Preferential trade programs have helped developing countries gain access to U.S. and EU markets. In 2002, 102 countries exported agricultural goods to the U.S. and 132 countries to the EU under these programs. The top beneficiaries from U.S. programs were Costa Rica, the Dominican Republic, Colombia, and Guatemala. The top beneficiaries from EU programs were the Ivory Coast, Argentina, China, and

India. Both the U.S. and the EU import large quantities of fresh and processed fruits and vegetables, sugar, tobacco and tobacco products, and cut flowers under these programs. The EU also imports large amounts of fish, shellfish, fats, and oils under these preferences. Even with this access, the value of agricultural imports under these programs is a relatively small share of total U.S. and EU agricultural imports, at 6 percent (\$3.1 billion) and 18 percent (\$11.2 billion) in 2002, respectively.

Still, developing countries strongly support these programs and have expressed concern about their future in light of the ongoing Doha negotiations, begun in 2001 under the auspices of the World Trade Organization (WTO). The value of these programs for beneficiary countries is high: in 2003, 50 percent of their total dutiable exports to the U.S. and 44 percent of their dutiable exports to the EU were exported under nonreciprocal preferences.



negotiations, as well as regional and bilateral trade agreements, may lead to reductions in tariff and nontariff measures faced by U.S. fruit and vegetable growers in global markets. **W**

Barry Krissoff,
barryk@ers.usda.gov

John Wainio,
jwainio@ers.usda.gov

This finding is drawn from . . .

Trade Issues Facing U.S. Horticulture in the WTO Negotiations, by Jason Donovan and Barry Krissoff, VGS-285-01, USDA, Economic Research Service, August 2001, available at: www.ers.usda.gov/publications/vgs/285-01/

Global Trade Patterns in Fruits and Vegetables, edited by Sophia Wu Huang, WRS-04-06, USDA, Economic Research Service, June 2004, available at: www.ers.usda.gov/publications/wrs/0406/



China's New Farm Policies Have Modest Impact

In a reversal of its longstanding practice of taxing farmers, the Chinese Government introduced direct subsidies to grain producers in 2004 and announced plans to eliminate its centuries-old agricultural tax. China also offered subsidies for seed and machinery purchases, boosted spending on rural infrastructure, extended more loans to farmers, and continued a program of domestic grain market liberalization. These policies are intended to address the country's widening urban-rural income gap and boost grain production. So far, the changes have had limited impact, but China may introduce policies with stronger incentives in coming years.

The new policies are symbolically important, but modest in size and impact. The grain subsidies of \$1.4 billion were spread over 140 million farms and amount to less than 2 percent of the value of grain production. Elimination of the agricultural tax is worth \$5 to \$7 billion, spread over some 200 million households, and will take place over several years. The combined benefits of subsidies and tax relief in 2004 are estimated to be about \$5 per rural household member.

Rural income and grain production in China did rise sharply during 2004, but the gains were due mostly to a combination of sharply higher farm prices and vigorous economic growth that

boosted nonfarm earnings. The policies resulted in only modest increases in income for most rural families. The subsidies provided little incentive to plant more grain since they were in most cases based on historical grain plantings.

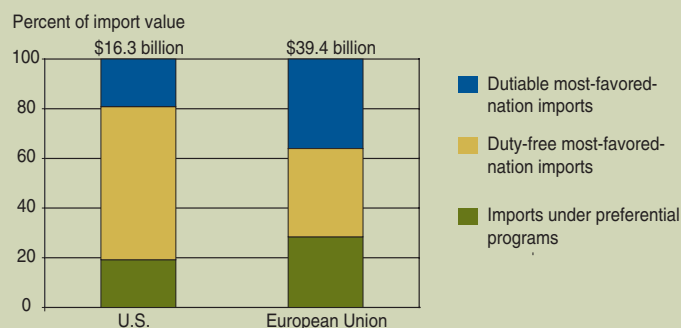
China's agricultural policy will evolve as policymakers try to balance multiple objectives and fine-tune policies. In early 2005, China announced that it will continue granting subsidies, speed up the elimination of the agricultural tax, limit increases in input prices, and set support prices for some grains. China also announced its intentions to place greater emphasis on raising grain yields by improving plant breeding and to raise investment in infrastructure. China may also adjust its subsidy methods. China has experimented with price- and production-linked subsidy policies in limited geographic areas, and such policies could be used more widely if policymakers believe that farmers need stronger incentives to produce grain. **W**

Fred Gale, fgale@ers.usda.gov

This finding is drawn from . . .

China's New Farm Subsidies, by Fred Gale, Bryan Lohmar, and Francis Tuan, WRS-05-01, USDA, Economic Research Service, February 2005, available at: www.ers.usda.gov/publications/wrs/0501/

The European Union imports more from beneficiaries of preferential trade programs than the U.S., 2002



Note: Most-favored-nation (MFN) treatment refers to a World Trade Organization rule requiring that each member country grant every other member the same tariff treatment. Exceptions are allowed under nonreciprocal preferential trade programs or when countries are members of free trade agreements or customs unions. Nonreciprocal program beneficiaries face MFN tariffs on exports of products not included in these programs, or on exports of included products that do not meet program eligibility requirements.

Source: U.S. International Trade Commission DataWeb (<http://dataweb.usitc.gov/>) and Organisation for Economic Co-operation and Development, *Preferential Trading Arrangements in Agricultural and Food Markets—The Case of the European Union and the United States*.

Much of the negotiations will center on reductions in most-favored-nation (MFN) tariffs. With lower MFN tariffs, the margins of preference—the differences between preferential and MFN tariffs—decrease. Thus, the advantage that beneficiaries now enjoy for products receiving preferential treatment could be lost. However, many products of interest to developing country exporters are currently either excluded from trade preference programs or their access is constrained to limited quota amounts. In these cases, multilateral trade agreements may afford developing countries the opportunity to broaden their export mix to developed countries if they include deep cuts in MFN tariffs for goods that are not eligible for preferential treatment. **W**

Shahla Shapouri, shapouri@ers.usda.gov

John Wainio, jwainio@ers.usda.gov

This finding is drawn from . . .

Agricultural Trade Preferences and Developing Countries, by John Wainio, Shahla Shapouri, Michael Trueblood, and Paul Gibson, ERR-6, USDA, Economic Research Service, May 2005, available at: www.ers.usda.gov/publications/err/6/

Companies Continue To Offer New Foods Targeted to Children

Food manufacturers have been responding to increased concerns about childhood obesity rates and the marketing of high-fat, sugary foods to America's children by developing new, more healthful foods and beverages. Between 2000 and 2004, the number of new whole-grain, low-fat, and low-sugar products targeted to children totaled 259, or 15 percent of all new children's foods and beverages, compared with 165, or 9 percent, from 1995 to 1999. Product introductions targeted to children accounted for over 10 percent of all new products in 2004, down from 12 percent for 2002 and 2003.

Food product introductions include new national and regional brands, new seasonal products, and new private label products, and most have a short lifespan. Industry analysts estimate that only between a fifth and a third of all new products appear in 75 percent of stores and generate noticeable sales in the first 9 months, then continue to grow in the second and third years.

Manufacturers introduced 35 new children's products with whole-grain ingredients during 2000-04. Breakfast cereals accounted for all but one of these product introductions, and 10 alone were introduced in 2004. More whole-grain products are expected in 2005, on the heels of new government dietary guidelines recommending more whole grains in American diets (see "Will 2005 Be the Year of the Whole Grain?" on page 12). Using ACNielsen household panel data, ERS tracked the sales of the 118 children's breakfast cereals introduced during 2000-03. Eighty-three percent of these cereals

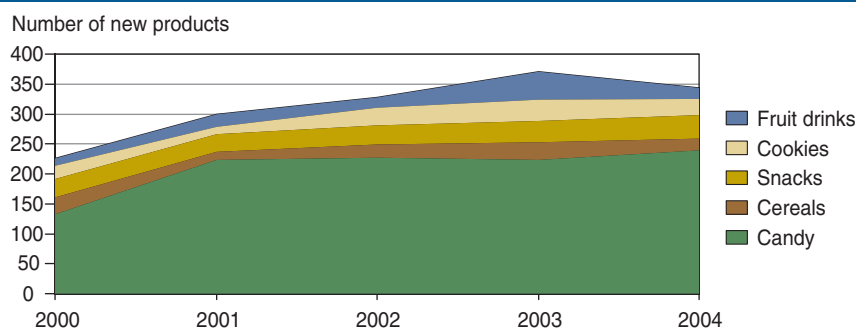


(including whole-grain cereals) were purchased by panel households and generated sales totaling 2.5 percent of all cereal sales over the period.

New children's beverages accounted for 5 percent of all beverages introduced during 2000-04. Forty-three percent of children's beverages introduced during the period were fruit and fruit-flavored drinks. Milk, nondairy, and yogurt beverages followed with slightly more than 21 percent of new children's beverages, and beverage mixes and flavorings constituted 12 percent. Soft drinks made up just 3 percent of new beverages targeted at children, compared with 9 percent in the previous 5 years.

Despite the gains made in introductions of more healthful foods, candy remains the leading new product category heavily marketed to children. Many of these new candies reflect seasonal, short-term introductions timed to coincide with holidays, mainly Halloween. Over 2000-04, 46 percent of new food products targeted at children were candies, 8 percent were snacks, 6 percent were cookies, and 5 percent were breakfast cereals. \mathcal{W}

Candy tops the list of new foods and beverages for children



Source: DataMonitor, Productscan database.

J. Michael Harris, jharris@ers.usda.gov

For more information . . .

The ERS Briefing Room on Food Market Structures:
www.ers.usda.gov/briefing/foodmarketstructures/

The U.S. Food Marketing System, 2002, by J. Michael Harris, Phil Kaufman, Steve Martinez, and Charlene Price, AER-811, USDA, Economic Research Service, June 2002, available at:
www.ers.usda.gov/publications/aer811/

After Leaving Welfare: Food Stamps or Not?

USDA's Food Stamp Program can ease the transition from welfare to independence by supplementing the resources of the working poor. However, many individuals who leave cash welfare, also known as Temporary Assistance for Needy Families (TANF), drop off the food stamp rolls, even though they appear to be eligible.

Past studies have identified the effects of individual and family demographics, such as marital status and household earnings, on Food Stamp Program participation. A new ERS report goes beyond the study of individual and family characteristics and examines the influence of community-level characteristics on program participation in Illinois of former welfare recipients who remain eligible for food stamps. The report concludes that the strength of community-level characteristics as an influence on a TANF leaver's decision to participate in the Food Stamp Program depends on the density of social networks in the individual's neighborhood.

Ties with and the frequency of contact with family, friends, and acquaintances are instrumental in helping individuals achieve certain tasks, particularly in seeking employment or accessing public benefits. Because such social networks are likely to be more concentrated in urban neighborhoods than in rural areas, the effects of community characteristics would be stronger for residents in Chicago than for downstate residents. For example, the proportion of people in poverty had a strong influence on the food stamp participation rate of TANF leavers in Chicago, but not outside Chicago. Public assistance offices often vary in the way they perform certain tasks, such as community outreach and communication. Differences in these efforts provide another source of variation in community characteristics. The study found evidence that such differences influence Food Stamp Program participation by TANF leavers, but again only in Chicago.

Other community-level characteristics, such as the proportion of single-mother households and the proportion of residents who are noncitizens, did not contribute to understanding Food Stamp Program participation by TANF leavers beyond the information measured by individual and family demographics. **W**

William Levedahl, levedahl@ers.usda.gov

This finding is drawn from . . .

Understanding the Food Stamp Program Participation Decisions of TANF Leavers, by R. Goerge, M. Reidy, S. Lyons, M. Chin, and A. Harris, Chapin Hall for Children at the University of Chicago, ERS project representative: William Levedahl, E-FAN-04-011, USDA, Economic Research Service, September 2004, available at: www.ers.usda.gov/publications/efan04011/



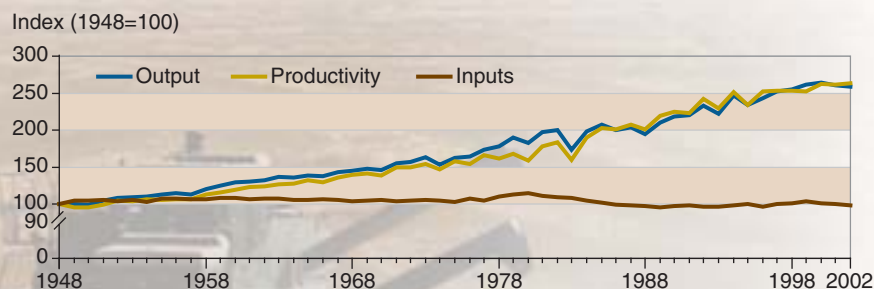
Ag Productivity Drives Output Growth

Increased use of inputs (such as capital, land, labor, and materials) has typically been the dominant source of economic growth for the U.S. economy as a whole and for most of its producing sectors. Agriculture is one of the few exceptions. Agricultural output in 2002 was 2.6 times as high as it was in 1948, but input use actually declined over the past half century. Increased productivity accounts for the difference. In recent years, however, productivity growth appears to have slowed, raising questions about future trends.

The singularly important role of productivity growth in agriculture is made all the more remarkable by the dramatic contraction in labor input in the sector since the end of World War II. Capital input increased initially but declined after 1981 as interest rates rose (raising the cost of capital). Land used in agriculture also declined over the period. Materials input, by contrast, increased over 1948-2002. But this positive contribution was not sufficient to outweigh the declines in land, labor, and capital inputs. The net contribution of all four inputs to growth in agricultural output was slightly negative, leaving output growth over the 1948-2002 period entirely attributable to productivity growth.

Increased use of agricultural inputs did contribute to output growth in some periods. Increases in materials fueled rapid output growth in the 1990s, and increases in both materials and capital boosted output growth in the 1970s. Growth in capital and materials inputs reduced the share of output growth derived from increased productivity during these periods. In spite of these anomalies, productivity growth was truly extraordinary over 1948-2002, averaging 1.8 percent per year. (By contrast, growth in private nonfarm business productivity averaged 1.2 percent per year over the same period.)

Agricultural productivity has driven output growth



While agricultural productivity has bounced up and down from year to year, typically driven by weather, it has generally trended upward over time. But productivity growth appears to have slowed since the mid-1990s. Does this reflect a change in trend? Productivity growth can arise from improvements in efficiency and technology as well as changes in the scale of production. A key source of productivity growth has historically been public investments in research. But those investments have been flat in real terms since the 1980s, raising questions about prospects for continued agricultural productivity growth in the future. **W**

Eldon Ball, eball@ers.usda.gov

This finding is drawn from . . .

The ERS Agricultural Productivity Database, available at:
www.ers.usda.gov/data/agproductivity/




Production Shifting to Very Large Family Farms

U.S. farm production is shifting to larger operations at the same time that people are continuing to be involved with part-time, small-scale farming operations. Small family farms (annual sales below \$250,000) still account for most of the Nation's farms, but their share of the value of U.S. agricultural production fell by nearly a third between 1993 and 2003. (Sales and production are adjusted for price changes and are reported in 2003 dollars.)

The number of small family farm operators who reported farming as their primary occupation has declined. In 1993, these farms accounted for 37 percent of all farms and 32 percent of the value of production. By 2003, their shares had fallen to 27 percent of all farms and 20 percent of production. By contrast, residential farms—or small farms whose operators report off-farm work as their primary occupation—rose from 36 percent of all farms in 1993 to 42 percent in 2003. But their average sales were very low (\$12,000 in 2003), accounting for only 5 percent of production. In addition, small family

farms with retired operators also increased as a proportion of all farms over the last decade.

Where did production go? Between 1993 and 2003, the number of nonfamily farms, which include farms with hired managers as well as farms organized as nonfamily corporations and cooperatives, grew by about a fourth to 35,000, and their share of production rose from 10 to 14 percent. But the major production shift is attributed to very large family farms, which have at least \$500,000 in annual sales. The number of very large family farms rose by nearly half to 66,600 over the period, while their share of production grew from 33 to 44 percent. Production of livestock and fruits and vegetables has long been concentrated among very large family farms; substantial shares of field crop production are shifting to those operations as well. 

Robert Hoppe, rhoppe@ers.usda.gov

David Banker, dbanker@ers.usda.gov

This finding is drawn from . . .

Structural and Financial Characteristics of U.S. Farms: 2004 Family Farm Report, edited by David E. Banker and James M. MacDonald, AIB-797, USDA, Economic Research Service, March 2005, available at: www.ers.usda.gov/publications/aib797/

For more information on the characteristics of U.S. farms and changes in their size distribution, visit the ERS Briefing Room on Farm Structure: www.ers.usda.gov/briefing/farmstructure/

Ag Biotech Patents on the Move




Innovation in agricultural biotechnology has recently flourished. Since the late 1980s and continuing into the 1990s, a variety of firms have secured key patents, from relatively small seed supply companies and research-oriented agbiotech firms to large multinational corporations. But beginning in the late 1990s, the larger companies began acquiring the smaller ones. Mergers among several of the large firms placed a majority of agbiotech patents in the hands of a dwindling number of large, international corporations.

This concentration of patent ownership means that an increasing share of future research will probably be done by companies with the large scale necessary to handle technology development, product marketing, and regulation compliance efficiently. But these companies might restrict research to complement their existing products. Small startup companies might still pursue innovative avenues of research, but probably with an eye toward becoming acquisition targets or benefiting from

licensing revenue. Patents will play a key role in either of these strategies.

A recent study analyzed changes in patent ownership of more than 3,000 agbiotech patents owned by a sample of U.S. and European companies. Agricultural biotechnology patents issued between 1976 and 2000 were classified by their original patent holders and their 2002 owners. The study reveals that by 2002, fully 95 percent of patents originally held by seed or small agbiotech firms had been acquired by large chemical or multinational corporations.

Furthermore, none of the smaller firms acquired patents from the larger ones, and none of the patents changed hands among the different types of large firms. For instance, chemical companies retained all 651 patents for which they were the original owners, but also acquired 219 patents from agbiotech firms and 451 patents from seed companies. With key patents being held by fewer companies, intellectual property ownership will probably continue to affect agbiotech industry structure and the pace and direction of future research. 

David Schimmelpfennig, des@ers.usda.gov

John King, johnking@ers.usda.gov

For more information . . .

The ERS Agricultural Biotechnology Intellectual Property database, available at: www.ers.usda.gov/data/agbiotechip/

See also "Mergers, Acquisitions and Flows of Agbiotech Intellectual Property," by David Schimmelpfennig and John King, in *International Trade and Policies for Genetically Modified Products*, R.E. Evenson and V. Santeniello (eds.), CABI Publishing, 2005.

Agricultural biotechnology patents moving to larger companies

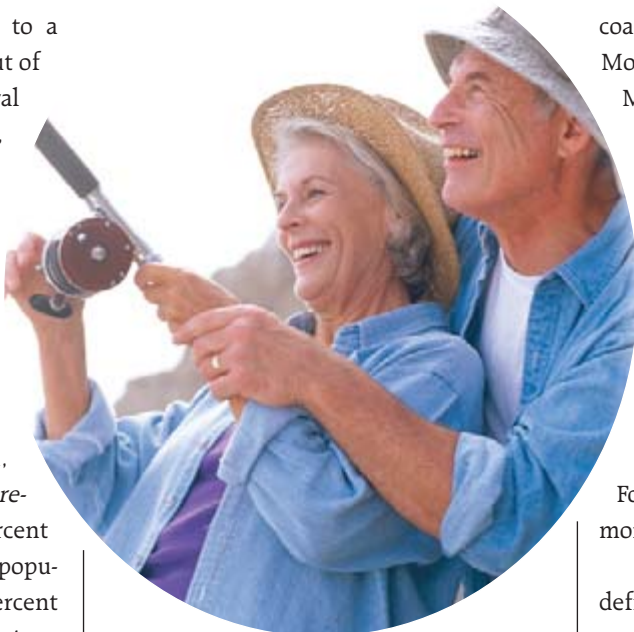
Final owners, 2002		Original patent holders, 1976-2000				
		Small companies		Large companies		
		Agbiotech	Seed	U.S. Chemical	Multinational	European
Small companies	Agbiotech	24 (5%)				
	Seed		31 (5%)			
Large companies	U.S. Chemical	219 (49%)	451 (69%)	651 (100%)		
	Multinational	175 (39%)	175 (27%)		528 (100%)	
	European	31 (7%)				718 (100%)
Total		449	657	651	528	718

Rural America as a Retirement Destination

Most Americans do not move to a new community when they retire, but of those who do, many settle in a rural area or small town. During the 1990s, a half million more persons who were age 60 or older in 2000 moved into nonmetropolitan (nonmetro) counties than out of them. However, not all nonmetro counties are as attractive to retirees as others.

In cooperation with the University of Wisconsin-Madison, ERS has identified 277 *nonmetro retirement destination counties* (13.5 percent of all nonmetro counties) where the population age 60 and older grew by 15 percent or more in the 1990s through net immigration. In contrast, only 36 nonmetro counties qualified as retirement areas during 1950-60, when data were first available.

Today's retirement areas are widely scattered across rural America. Warm winter areas have their appeal, but so, too, do



many counties in the cold winter climate of the Upper Great Lakes, or the uplands of the Ozarks and the southern Blue Ridge Mountains, especially around dam reservoirs. Other destinations are the Texas Hill Country, both the Atlantic and Pacific

coasts, and many parts of the inland Mountain West from Montana to New Mexico. With an estimated net in-movement of 17,900 older people from 1990-2000, Mohave, AZ, had the highest increase of all counties. Sussex, DE, and Citrus and Sumter Counties, FL, also had retiree in-movement of 10,000 or more each. The most rapid relative increases by far took place in Sumter, FL, and Nye, NV, where the population age 60 and older rose by 125 percent through in-movement. Fourteen other counties had increases of more than 50 percent.

Although retirement counties are defined only by the growth of their older population, they also tend to have high overall population growth. From 2000 to 2003, their total population grew by 4.8 percent, three times as fast as total U.S. nonmetro population growth and faster than any other type of nonmetro county.

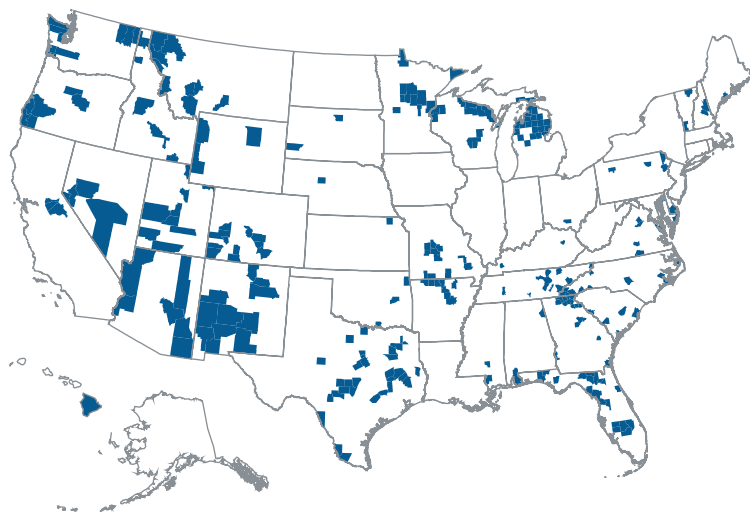
The high net movement of older people to 277 nonmetro counties came despite the fact that persons reaching age 60 during the 1990s were the survivors of the low birth rate years of the 1930s. Today, in contrast, members of the much larger birth cohorts of the 1940s are now entering their sixties. Thus, the prospect is for greater retiree movement to rural and small-town locales and an increase in the number of counties that can fairly be termed retirement counties. W

Calvin Beale, cbeale@ers.usda.gov

For more information . . .

The County Typology Codes chapter of the ERS Briefing Room on Measuring Rurality: www.ers.usda.gov/briefing/rurality/typology/

Nonmetro retirement destination counties are widely scattered



Retirement destination counties—number of residents 60 and older grew by 15 percent or more between 1990 and 2000 due to immigration.

Source: Calculated by ERS using data from the U.S. Census Bureau.

Most Low Education Counties Are in the Nonmetro South

In today's economy, workforce education is increasingly viewed as a potential catalyst for local economic and community development. Rural America now has twice the share of college graduates as a generation ago. Despite these overall gains, educational attainment varies widely within rural areas.

ERS's recently revised county typology classifies *low education counties* as those where at least one of every four adults age 25-64 has not completed high school. In 2000, ERS identified 622 low education counties in the United States, with 499 (80 percent) in nonmetropolitan (non-metro) areas. Nearly 9 of 10 low education counties are located in the South, including a majority of southern counties with historically large shares of Blacks and Hispanics. Similarly, low education counties in the West are concentrated in areas with large ethnic minority populations, such as California's Central Valley and portions of Arizona and New Mexico.

More than half of all nonmetro low education counties are persistently poor or have low rates of employment. In fact, the geographic concentration of rural low education counties is similar to that of persistent poverty and low employment counties, from Appalachia to the Mississippi Delta to the Rio Grande Valley. This

geographic association reflects the difficulty that adults without high school diplomas have in finding and retaining jobs that pay enough to place them above the poverty line. It also underscores the difficulties faced by low education counties in attracting good jobs and keeping highly educated residents.

Nearly half of the remaining nonmetro low education counties—neither persistently poor nor low employment—are dependent on manufacturing. Their relative prosperity is due largely to the presence of factory jobs that provide less-educated workers with stable work at family-sustaining wages. The long-term decline in manufacturing, however, may present a significant challenge to the future economic well-being of this group of low education counties.

Population and employment in nonmetro low education counties grew more slowly than the nonmetro average during the 1990s due in part to the reliance of these counties on older industries. The South, with a long history of low educational attainment, low-skill economies, and low rates of labor force participation, epitomized this trend. Low education counties in the South had 13.5 percent employment growth in the 1990s, compared with the nonmetro average of 18.0 percent. Yet in the Midwest, the 27 nonmetro low education counties outperformed other counties in both employment and earnings-per-job growth. This more rapid growth was due largely to Hispanic and Asian workers with limited formal education. Such regional differences in the causes and consequences of low education populations suggest that local context is crucial when planning economic development strategies with a human capital focus. *W*

Robert Gibbs, rgibbs@ers.usda.gov

For more information . . .

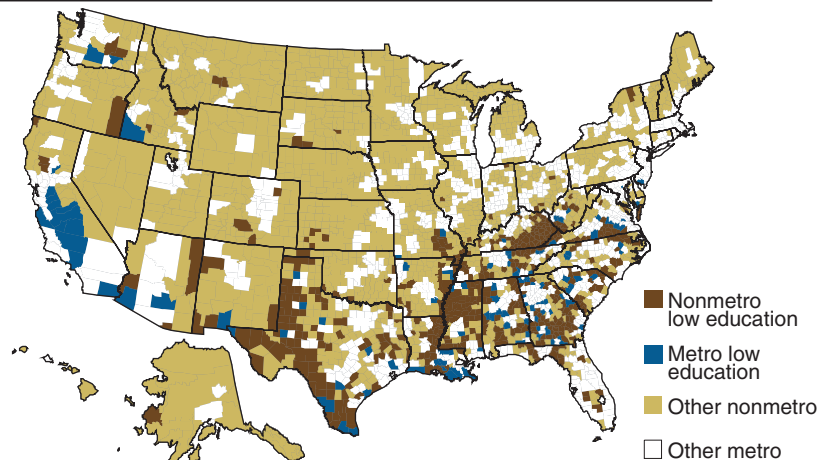
The County Typology Codes chapter of the ERS Briefing Room on Measuring Rurality:

www.ers.usda.gov/briefing/rurality/typology/ and the Rural Education chapter of the ERS Briefing Room on Rural Labor and Education:

www.ers.usda.gov/briefing/laborandeducation/ruraleducation/



Low education counties are concentrated in the South and Southwest



Low education counties—25 percent or more of adults 25-64 years old in 2000 had not completed high school.

Source: Calculated by ERS using data from the U.S. Census Bureau.

Milestones in U.S. Farming and Farm Policy

Carolyn Dimitri, cdimitri@ers.usda.gov Anne Effland, aeffland@ers.usda.gov

U.S. agriculture underwent a tremendous transformation during the 20th century—the structure of farming and rural life today barely resembles that of the early 1900s. A comparison of six basic agricultural indicators across the century reveals a dramatic transformation of the U.S. agricultural sector. Snapshots of five points in time—1900, as the century opened; 1930, as the Depression began; 1945, as World War II ended; 1970, as the post-war economic expansion began to wane; and 2000/02, on the brink of a new century—serve to highlight key milestones of change in U.S. farming and farm policy during the 20th century.

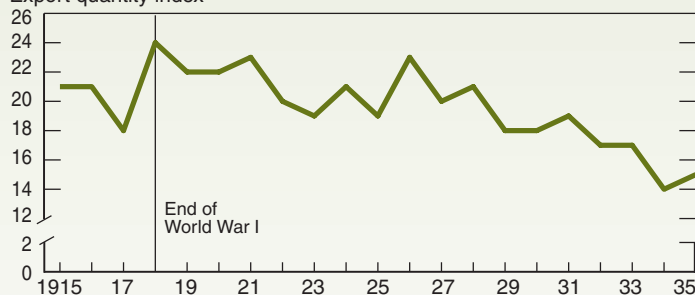


Integration of farming into the wider economy, 1900–30

New farming technologies and growing demand for consumer goods drew agriculture and farm households into a more integrated relationship with the general economy. Farm household use of purchased farm inputs and household goods, such as cars and radios, often required increased use of credit, and market-determined commodity costs and prices became more critical to farm profitability and farm household well-being. Agricultural producers received high prices through most of this period, due to domestic demand fueled by an increasingly urban population and by export demand spurred by World War I. A sharp drop in export demand following the war triggered a price collapse in 1920–21 that continued through the decade and led to widespread farm bankruptcies and an economic crisis in the agricultural sector. In response, political efforts began in the 1920s to secure government policies to improve access to credit and to support agricultural prices that would enhance farm incomes.

Farm exports begin to fall as wartime demand disappears with World War I's end

Export quantity index

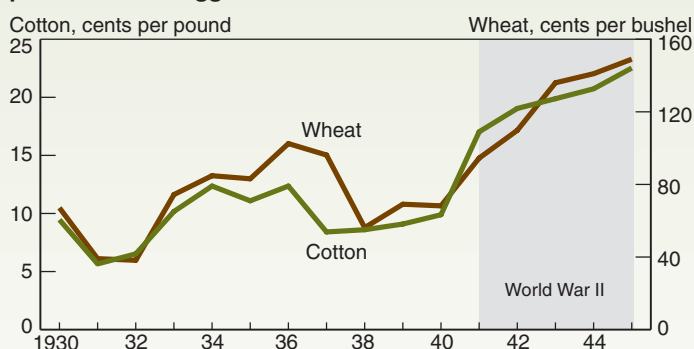


Note: Standard techniques were used to splice together four series using different base years; final base year is 1967. Data not available before 1915.
Source: Export quantity index, *Agricultural Statistics*, USDA, various issues.

National crises and the foundations of Federal farm policy, 1930–45

Economic distress in the agricultural sector in the 1920s was followed by the Great Depression in the 1930s, leading to unprecedented government intervention (via the New Deal) in the form of emergency programs for both the industrial and the agricultural sectors. The Agricultural Adjustment Act of 1933, effectively the first farm bill, launched the New Deal's emergency farm programs. The act's goals were to raise prices for farm products and protect the equity of farmers in debt. Relief and structural adjustment programs addressed the problems of marginal farms and rural poverty. The Soil Conservation and Domestic Allotment Act of 1936 reflected a new interest in soil conservation, simultaneously establishing programs to improve farm incomes and protect soil resources. Renewed demand generated by World War II improved farm prices by 1945, and U.S. agriculture entered a sustained period of productivity gains.

The New Deal helps boost farm prices, but World War II proves to be a bigger stimulus



Source: *Agricultural Statistics*, USDA, 1946.

100 years of structural change in U.S. agriculture

	1900	1930	1945	1970	2000/02
Number of farms (millions)	5.7	6.3	5.9	2.9	2.1
Average farm size (acres)	146	151	195	376	441
Average number of commodities produced per farm	5.1	4.5	4.6	2.7	1.3
Farm share of population (percent)	39	25	17	5	1
Rural share of population (percent)	60	44	36 (1950)	26	21
	Percent				
Off-farm labor*	na	100 days	27	54	93

na=not available.

*1930, average number of days worked off-farm; 1945, percent of farmers working off-farm; 1970 and 2000/02, percent of households with off-farm income.

Sources: U.S. Census Bureau, Census of Agriculture, and Census of Population, various issues, 1900-2000; USDA Census of Agriculture, 2002; and B.



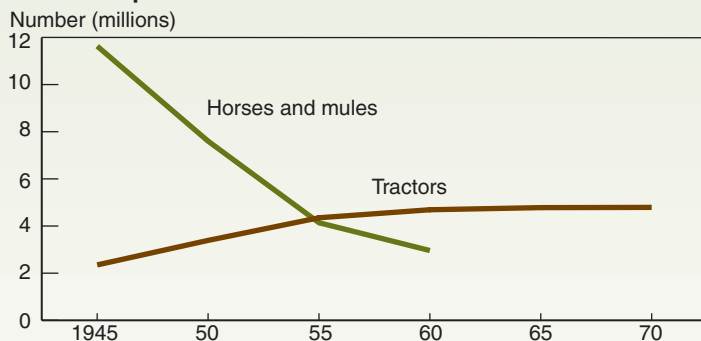
This article is drawn from ...

The 20th Century Transformation of U.S. Agriculture and Farm Policy, by Anne Effland and Carolyn Dimitri, EIB-3, USDA, Economic Research Service, June 2005, available at: www.ers.usda.gov/publications/eib3/

Structural transformation of the farm sector, 1945–70

By 1970, animal power on farms had given way to tractors and other machinery for farm production processes. Advances in productivity through mechanization, plant and animal breeding developments, and new chemical fertilizers and pesticides led to fewer, larger, more specialized farms and a massive migration out of farming. Farm families increasingly sought income and opportunities from off-farm work, facilitated by a diversifying rural economy. Productivity increases led to commodity surpluses in government warehouses, the result of loan programs that allowed farmers to forfeit commodities in lieu of repayment when prices fell. Commodity policies were adjusted to reduce buildup of surpluses, while new policy approaches, such as food assistance and the soil bank programs, sought to increase demand and reduce supply in ways that simultaneously addressed such concerns as poverty and soil conservation.

Tractors replace work animals on farms

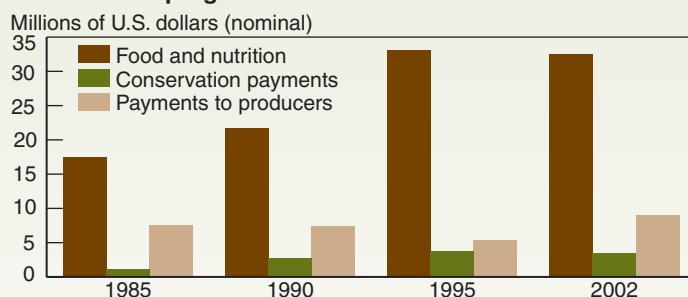


Note: Work animals were not enumerated after the 1960 Census.
Sources: U.S. Census Bureau, Census of Agriculture, various issues, and *Agricultural Statistics*, USDA, various issues.

Globalization and new stakeholders in agriculture, 1970–2000/02

Over the last three decades, agriculture worldwide became increasingly integrated. While exports continued to account for 20-30 percent of U.S. farm income, U.S. farmers faced new challenges, including the emergence of new foreign competitors and trade tensions over new technologies and food safety assurances. At home, new stakeholders joined the farm policy debate, as consumers became increasingly concerned about food safety, nutrition, food variety and quality, and food prices, and environmental interests worked to bring environmentally friendly production methods to agriculture. The food industry responded with increased use of contracting and supply chain coordination to ensure supply and quality control. Government expenditures on food and nutrition programs and natural resource conservation increased, and commodity policy shifted toward greater market orientation, with the 1990 farm bill giving growers greater planting flexibility and the 1996 farm bill basing payments on historical production rather than current output.

Government payments shift toward food, nutrition, and conservation programs



Sources: *Agricultural Statistics*, USDA, various issues; ERS Briefing Room on Farm Income, available at: www.ers.usda.gov/data/farmincome/finfidm.htm; *Agricultural Resources and Environmental Indicators*, AH-722, USDA, Economic Research Service, February 2003, available at: www.ers.usda.gov/publications/arei/ah722/arei6_1/table6_1_2.xls



Will 2005 Be the Year of the Whole Grain?

Jean Buzby

jbuzby@ers.usda.gov

Hodan Farah

hfarah@ers.usda.gov

Gary Vocke

gvocke@ers.usda.gov

Will 2005 be the year of the whole grain? According to the new *Dietary Guidelines for Americans*, it should be. For the first time, the *Dietary Guidelines* have specific recommendations for whole grain consumption separate from those for refined grains. The *Guidelines*, released in January 2005, encourage all Americans over 2 years old to eat at least three 1-ounce-equivalent servings of whole grains each day, or roughly half of their recommended 5 to 10 daily servings of grains, depending on calorie needs.

The goal of this new recommendation is to improve Americans' health by raising awareness of whole grains and their role in nutritious diets. The *Guidelines* could also, however, have big impacts on farmers and farm production. How big depends on consumers' and manufacturers' responses.

Will Consumers Follow the Guidelines?

Historical eating trends, and the popularity of diets, demonstrate that consumers do modify their food choices in response to diet and health information. For example, in response to health warnings about consuming too much saturated fat, per capita consumption of whole milk declined by 70 percent between 1970 and 2003, while consumption of lower fat and skim milk increased by 140 percent. However, trends in overall fat consumption suggest that some dietary advice is ignored. Total per capita consumption of added fats and oils has risen 63 percent since 1970, despite widespread health warnings.

The new whole-grain recommendations are ambitious, given Americans' current eating patterns. Though Americans have been eating more grain products, they consume few whole grains. According to ERS food availability data, Americans



were eating, on average, 10 servings of grains a day in 2003—only 1 of which was whole grains. Whole-grain data are incomplete, as information on some whole grains, such as buckwheat and quinoa, are not available.

Whether consumers embrace whole grains involves weighing their attributes—taste, convenience, availability, price, and perceived health benefits—relative to other food choices. For most consumers, taste is the deciding factor, as shown by years of survey data from the Food Marketing Institute. Whole-grain products that fail to pass the consumer taste test will have difficulty competing against refined products that do.

Convenience may also be an issue for some consumers. Many whole grains require longer preparation and cooking time than refined grains. For example, brown rice takes 25 minutes longer to cook than white. For some consumers, availability may also hinder whole-grain consumption, though less so now that whole-grain products are increasingly plentiful in places other than health food stores and mail-order companies.

Cost is another consideration. Historically, some whole-grain products were more expensive because they were specialty items produced in smaller quantities. A 2001 ERS study found that the average supermarket price for whole-wheat or whole-grain bread in 1999 was \$1.38 per pound, versus \$1.15 for non-whole-grain bread. Brown rice cost \$1.16 per pound, versus \$0.72 for nonwhole-grain rice. A more recent ERS analysis puts the average cost of whole-grain/whole-wheat bread at \$1.99 per pound in 2003, versus \$1.66 per pound for white bread. Where they exist, price spreads above industrywide thin profit margins may provide an unexpected benefit to food manufacturers who produce whole-grain products. However, any price spread will likely be short-lived as more manufacturers join the whole-grain market.

Consumers Confused Over Labels and Serving Sizes

For consumers who follow the *Guidelines* and decide to eat more whole grains, constraints may remain. Even motivated consumers may have difficulty meeting dietary recommendations because it is often tough to tell which





products contain whole grains. There is no universally accepted definition of whole-grain foods, and labels may be hard to understand. Labels like "wheat bread," "stone-ground," and "seven-grain bread" do not guarantee that the food contains whole grains. Color is not a good indicator of whole grains either because foods may be darker simply because of added molasses (see box, "What Are Whole-Grain Foods?").

The difficulty consumers have in identifying whole grains makes it harder to meet the dietary requirements. According to a Natural Marketing Institute report, 71 percent of consumers think that they are already consuming enough whole grains. Data based on consumers' recalling their intake from the previous day, however, indicate that nearly 40 percent of Americans consume no whole grains. Consumers who mistakenly think that they are already consuming enough whole grains will not make the effort to increase their intake.

Once consumers identify whole-grain products, they may still struggle with getting recommended amounts of whole grain into their diets. Most consumers are unclear on what a serving of whole grains is, particularly in an era where oversized food portions are common. In general, a serving of grains is an ounce-equivalent of food, such as a slice of bread; a half cup of cooked cereal, rice, or pasta; or about 1 cup of dry cereal ($\frac{1}{4}$ cup for dense, granola cereals to $1\frac{1}{2}$ cups for some unsweetened puffed cereals). Consumers who do not have a good sense of a serving size may have difficulty judging how their daily consumption tallies up against serving recommendations.

What Are Whole-Grain Foods?

There is no universally accepted definition of whole grains. The new *Dietary Guidelines* uses the American Association of Cereal Chemists' definition, which is "foods made from the entire grain seed, usually called the kernel, which consists of the bran, germ, and endosperm. If the kernel has been cracked, crushed, or flaked, it must retain nearly the same relative proportions of bran, germ, and endosperm as the original grain in order to be called whole grain." The U.S. Food and Drug Administration (FDA) requires foods that bear the whole-grain health claim to: (1) contain 51 percent or more whole-grain ingredients by weight per reference amount and (2) be low in fat.

Whole grains can be consumed either as a single food, such as wild rice and popcorn, or as a food ingredient, as in some multigrain breads. Whole grains are good sources of fiber and other nutrients, such as calcium, magnesium, and potassium. Diets that contain at least three or more ounce-equivalents of whole grains per day may help with weight control and can reduce the risk of several chronic diseases, such as coronary heart disease and some kinds of cancer. Refined grains are the product of a process that removes most of the bran and some of the germ. During this process, some dietary fiber, vitamins, minerals, and other natural plant compounds are lost.

Almost all refined grains are enriched before being further processed into foods, a step taken by many grain companies since the 1940s. In order to conform to FDA's standards of identity, enriched foods were required to be fortified with thiamine, riboflavin, niacin, and iron. In 1998, the FDA required that folic acid be added to the enrichment mixture. Currently, enrichment is not required for whole-grain foods.

Examples of whole grains:

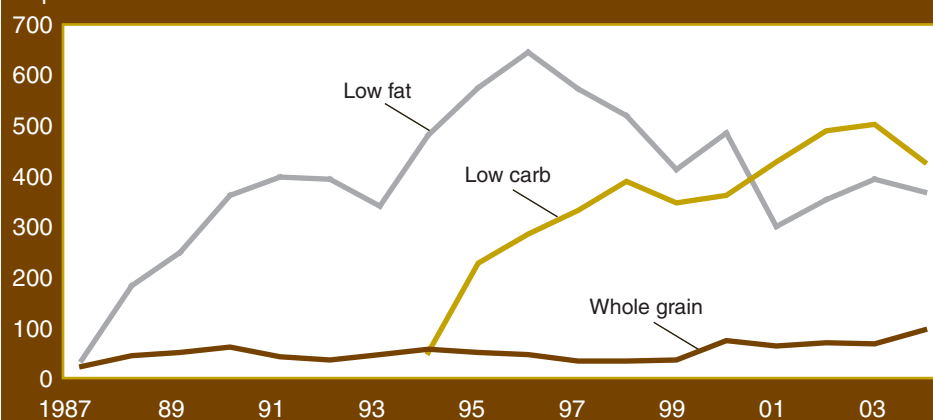
Brown rice	Buckwheat
Bulgur (cracked wheat)	Millet
Popcorn	Sorghum
Triticale	Whole-grain barley
Whole-grain corn	Whole oats/oatmeal
Whole rye	Whole wheat
Wild rice	Quinoa

Source: *Dietary Guidelines for Americans*, jointly issued by USDA and the U.S. Department of Health and Human Services, January 2005, www.cnpp.usda.gov/DG2005/



Whole-grain product introductions on the rise but below low-fat and low-carb

Reported introductions



Source: DataMonitor, Productscan database.

In the short run, consumers will probably not meet the goal of three ounce-equivalents of whole grains per day. However, as knowledge of the *Guidelines* grows and as consumers learn more about the health benefits of whole grains, consumption patterns will likely change. Consumers, however, are only one side of the equation; manufacturers will play their part in supplying whole-grain alternatives.

Manufacturers Are Listening

Food manufacturers can serve as catalysts to change by quickly responding to, or even anticipating, dietary trends. In their business decisions, they incorporate the latest scientific evidence and market research, while closely following food consumption trends. In anticipation of the new *Dietary Guidelines* and consumers' reactions to them, many companies launched new branded packaged foods with higher whole-grain content in 2004. For example, General Mills announced plans to switch all its cereal formulations to whole-

grain products. Nestlé launched a frozen entrée line made with 100-percent whole grains, and Sara Lee launched its Heart Healthy Plus line of fortified, 100-percent whole-wheat and multigrain breads. That same year, ConAgra introduced a new whole-grain flour called "Ultragrain White Whole Wheat." ConAgra uses both an extra refining process and a less commonly used wheat (hard-white winter) to make whole-wheat products similar in taste and "mouth feel" to refined products, while retaining the nutritional benefits of whole grains.

In addition to new product offerings, some manufacturers are educating consumers about the benefits of whole grains and how to identify whole-grain products. Some have proposed or currently use content descriptors to indicate if their products contain whole grains. General Mills, for example, has three descriptors on its cereal boxes indicating whether a cereal serving is an "excellent source" of whole grains (16 grams or more per serving), a "good source" of whole grains (8 to less than 16 grams), or "made with" whole grains (at least 8 grams).

Other important food industry sectors are also involved in the whole-grains

story. Foodservice operators and retailers are adding more whole-grain items. For example, in January 2005, Noodles & Company introduced a whole-grain fettuccine to the menus in all of its restaurants. In February, the Grain Foods Foundation, a joint venture of the milling and baking industry, launched a \$3.5-million Grains for LIFE campaign to educate the public about the benefits of whole-grain and refined-grain foods. While the food industry has been responsive to the *potential* for increased whole-grain demand, the number of new products is still far below low-fat and low-carb product introductions. This responsiveness will likely accelerate in the face of *actual* increases in demand for whole grains.

Impact on Grain Producers Depends on Many Factors

In general, it takes less raw grain to produce a whole-grain product than a similar refined product. Whole-grain products use most of the grain kernel while refined-grain products lack most of the bran. For example, whole-wheat flour uses about 25 percent less wheat than refined flour (see box, "If Consumers Follow the *Guidelines*: A Wheat Case Study").

The remaining byproducts from refined-flour milling are diverted to secondary uses. Bran, for example, is used as an ingredient in food products and livestock feed. A shift from refined-grain to whole-grain products could reduce the quantity of grain milled and supplies of byproducts for secondary markets.

The net effect on grain producers of a shift to whole-grain products will depend on a myriad of factors, including the type of grain demanded by food processors and the location of the producer. Wheat farmers in the Midwestern, South-Central, and Eastern United States favored by longer growing seasons and more abundant rainfall would find it easier to switch to other crops.



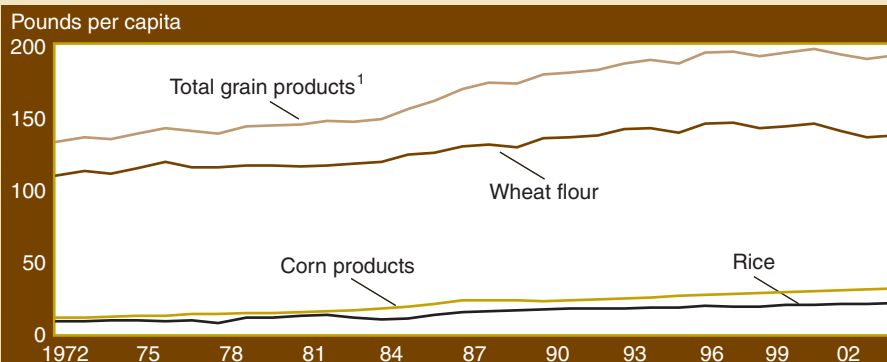
If Consumers Follow the *Guidelines*: A Wheat Case Study

Wheat made up 71 percent of all U.S. grain consumption in 2003. One pound of wheat makes 0.98 pound of whole-wheat flour but only 0.74 pound of refined flour. If manufacturers increased the amount of whole-wheat flour production from 5 percent of flour production (estimated amount in 2003) to the *Guidelines* recommendation of 50 percent, only 797 billion bushels—versus 912 billion bushels—of wheat will be needed. Unless secondary demand increased to make up some or all of the difference, demand for wheat for domestic flour production would drop by around 13 percent. This would put downward pressure on wheat prices. However, since less than a third of the wheat supply is used for domestic food consumption, the price effect is likely to be limited.

A drop in wheat demand would trigger a change in land allocation. ERS estimates that for each 1-percent increase in domestic production of whole-wheat flours, 50,000 to 70,000 fewer acres of wheat would be harvested (based on the marketing year 2004/05 yield of 43.2 bushels per acre). To put this acreage drop into perspective, there are a projected 58 million acres planted to wheat in 2005, with a projected wheat harvest of 49.3 million acres.

Some farmers will shift wheat acreage to other crops or varieties. More acreage might be planted with hard-white wheat if the demand increases for foods made with it and if the current price premiums of 1 to 3 percent are sufficiently high, or rise, to overcome producers' hesitation to grow this crop. (Hard-white wheat varieties are more susceptible to pre-harvest rainfall damage than hard-red wheat varieties.) In 2003, plantings of hard-white wheat accounted for 2.3 percent of all wheat grown in major States, largely in the Pacific Northwest and the Plains (e.g., Washington, Kansas, and Colorado). A shift to whole grains could also affect the demand for certain kinds of grains—and the demand for acreage suitable for growing those varieties. Rye flour and oat/barley products, which are mainly whole grain, could become more popular, as could minor grain products such as kasha and bulgur.

Wheat flour made up 71 percent of the total food grains available for consumption in 2003



¹Total includes oat, barley, and rye products.

Source: USDA's Economic Research Service, 1972-2003.

The eventual impact on grain producers will also depend on the interaction of market forces in domestic and foreign markets. In the United States, other commodity markets would interact to lessen adjustments in the grain market due to a shift to whole-grain products. For example, farmers may use a larger share of corn and sorghum instead of wheat byproducts in livestock rations. In international markets, if domestic demand drops for wheat grain, there may be larger U.S. supplies available for export to countries such as Egypt, Japan, and Mexico, three of our largest foreign wheat markets. In the longer term, as companies develop new processing methods and whole-grain products that appeal to consumers, domestic demand for grains will likely increase.

Consumers' reactions to the new *Dietary Guidelines* will help determine the mix of grains grown by farmers and the mix of products supplied by manufacturers and served by restaurateurs. Nutrition and farm policy analysts are watching to see how the whole-grains story unfolds. Only then will the *Guidelines*' true impacts on Americans' nutritional health and on U.S. agriculture become clear. **W**

This article is drawn from . . .

ERS Food Consumption (Per Capita) Data System, available at: www.ers.usda.gov/data/foodconsumption/

Understanding Demand Shifts for Grain-Based Foods, Conference co-sponsored by the Economic Research Service and the Farm Foundation, September 2004, proceedings available at: www.farmfoundation.org/projects/04-24DemandShiftsGrainBasedFoods.htm

Hard White Wheat at a Crossroads, by William Lin and Gary Vocke, WHS-04K-01, USDA, Economic Research Service, December 2004, available at: www.ers.usda.gov/publications/whs/dec04/whs04k01/

FEATURE

AMBER WAVES 18 VOLUME 3 • ISSUE 3

North America Moves Toward One Market

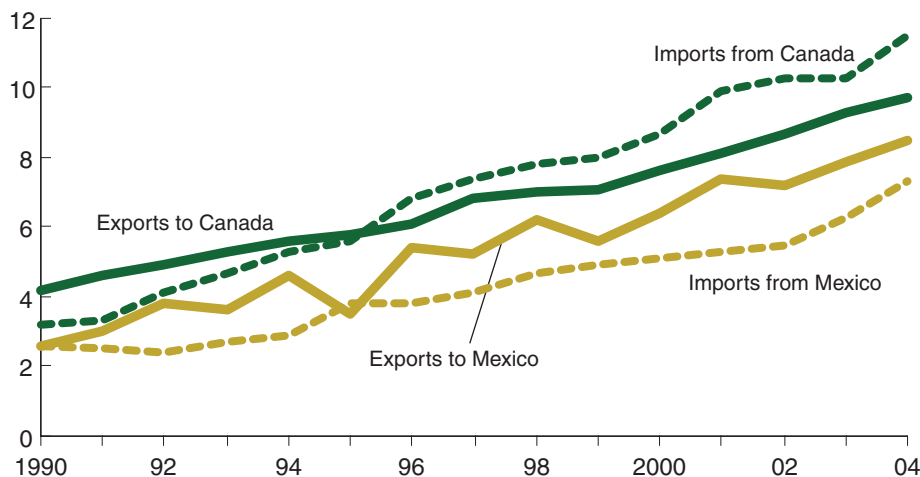
Steven Zahniser
zahniser@ers.usda.gov

Focus too much on the challenging issues that have faced North American agriculture over the past several years and you might not notice an important long-term development: the agricultural economies of Canada, Mexico, and the United States are increasingly behaving as if they form one market. Not only is U.S. agricultural trade with Canada and Mexico on a clear upward trend, but firms are reorganizing their activities around continental markets for both inputs and outputs. For example, many North American pastures and feedlots contain animals that have lived in more than one NAFTA country, and U.S. consumers are purchasing fresh tomatoes and peppers produced by their neighbors both to the south *and* to the north.

Trade liberalization under the Canada-U.S. Free Trade Agreement (CFTA, implemented in 1989) and the North American Free Trade Agreement (NAFTA, implemented in 1994) is just one factor behind the growing integration of North American agriculture. To encourage this trend, decisionmakers in both government and the private sector have pursued greater institutional and policy coordination. Structural changes within agriculture have also facilitated integration, as have continued population growth and sustained periods of economic expansion, which have boosted consumer demand and forced new economic arrangements within the agricultural and processed food industries.

Rising U.S. agricultural trade with Canada and Mexico is just one sign of greater market integration in North America

U.S. dollars (billion)



Source: USDA, Foreign Agricultural Trade of the United States database.

Generally speaking, integration with the United States is more pronounced for Canada than it is for Mexico, due to Mexico's lower per capita income and the fact that U.S.-Canada economic relations have been relatively close for a longer period of time than U.S.-Mexico economic relations. And while integration characterizes much of agriculture, it is lagging in some sectors. The high tariff and quota barriers that govern U.S.-Canada dairy and poultry trade were formally excluded from trade liberalization, and disputes concerning U.S.-Mexico sugar and sweetener trade have left many formidable trade barriers in place.

Mexican Livestock Industry Drives Integration of Grain Markets

The past 11 years (1994-2004) have seen a rapid integration of North American grain markets. Since NAFTA's implementation in 1994, U.S. exports to Mexico, Canadian exports to the United States, and U.S. exports to Canada have all more than doubled. U.S. and Canadian markets were already well inte-

grated at the beginning of the NAFTA period, but over the short span of about a decade, the grain and oilseed markets of Mexico and the United States have achieved a level of integration that is starting to approach that between Canada and the United States.

While NAFTA provides much of the legal framework for this growing trade and has facilitated the development of cross-border supply chains, the primary catalyst for this trade has been a dramatic expansion of Mexico's hog and poultry industries, driven in turn by a rising demand for meat in that country. These industries, in their drive to expand output and lower production costs, rely heavily on U.S. feedstuffs—imports account for roughly half of the feed ingredients used by Mexican poultry producers. Rising pork and poultry production in Mexico has contributed to the doubling of U.S. exports to Mexico of feed grains, oilseeds, and related products since 1993. As a result, Mexico has experienced a marked increase in per capita meat consumption. Broiler consumption rose 62 percent between 1993 and 2004, while pork consumption increased 41 percent. Canadian hog and cattle producers also rely on U.S. feed products, but to a lesser extent.

In the coming decade, Mexico's grain market is likely to experience further integration with the United States. NAFTA



allows Mexico to apply a transitional tariff-rate quota to U.S. corn until 2008. In fact, Mexico has pursued a more liberal trade policy than NAFTA requires, particularly with respect to yellow corn, so that the country can benefit more fully from the integrated grain market. With the end of the transitional restrictions, the composition of U.S. grain exports to Mexico is likely to shift more toward corn and away from sorghum.

Yellow corn, which is used in Mexico primarily for animal feed and the manufacture of corn starch, continues to make up the bulk of U.S. corn exports to Mexico. In recent years, the United States has also exported to Mexico large quantities of cracked corn, which consists of broken or ground kernels and is used as animal feed. NAFTA treats cracked corn as a distinct commodity from corn, and cracked corn is not subject to the trade restrictions that apply to U.S. and Canadian corn in general and has enjoyed duty-free status in Mexico since 2003.

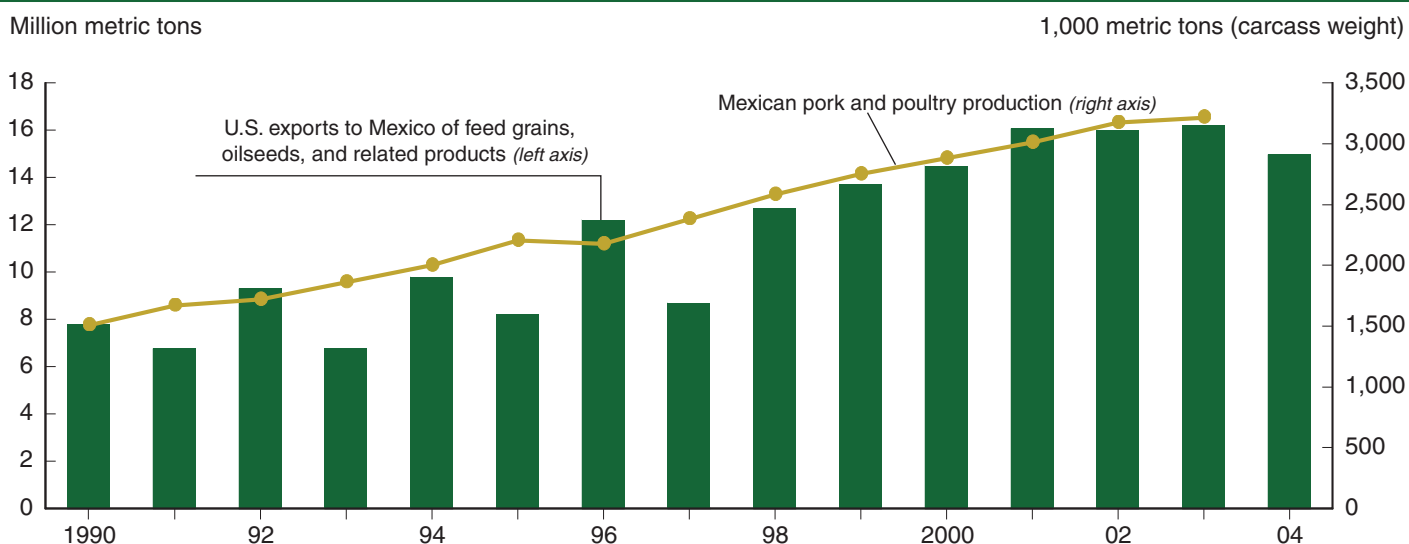
Mexico is also a potential market for U.S. white corn, used in Mexico to pro-



duce tortillas and other corn-based foods. But the Mexican Government has encouraged the domestic production of white corn by providing marketing payments to certain commercial producers. As a result, U.S. white corn exports to Mexico have

declined sharply since 2000. Moreover, the Mexican Congress has mandated the application of NAFTA's over-quota tariff to white corn. This tariff, 54.5 percent for 2005, is far higher than the 2 or 3 percent

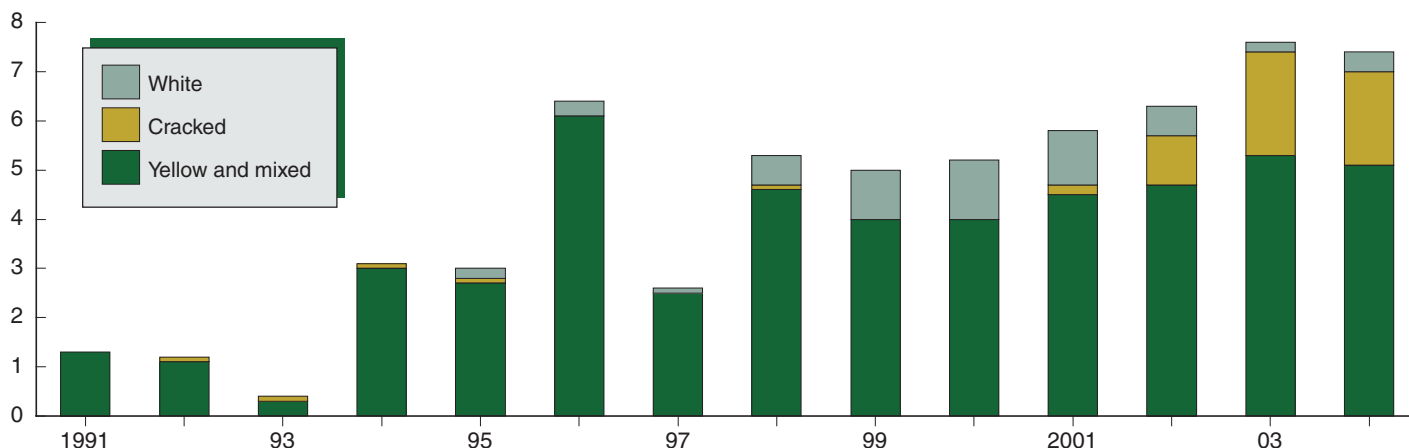
U.S. feedstuffs are crucial to Mexican pork and poultry production



Sources: USDA, Foreign Agricultural Trade of the United States database (exports) and Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca, y Alimentación, Servicio de Información y Estadística Agroalimentaria y Pesquera (production).

U.S. corn exports to Mexico still consist primarily of yellow corn

Million metric tons



Note: Yellow and mixed corn exports are calculated by subtracting white corn exports from total corn exports. Cracked corn (broken or ground kernels) is defined as a distinct commodity from corn. Like yellow corn, it is primarily used as animal feed.

Sources: USDA, Foreign Agricultural Trade of the United States database (total corn and cracked corn exports) and USDA, Agricultural Marketing Service, *Grain and Feed Weekly Summary Statistics*, various issues (white corn exports).

that was applied during much of NAFTA's first decade (1994-2003).

Livestock Production Crosses International Borders

The principal drivers of integration in North American livestock markets have been harmonization of sanitary standards and industrial restructuring. As a result of these forces, many North American pastures and feedlots now include animals that have lived in more than one NAFTA country. Hog production in Canada and the United States has become highly integrated over the past two decades, with Canada shipping rising numbers of feeder pigs to the United States for finishing (the last stage of production) and slaughter. Similarly, Mexico is a net exporter of cattle to the United States, and this trade consists primarily of feeder calves.

Mutual agreement on sanitary regulations is critical to increasing integration in this market. Ultimately, the removal of tariffs and quotas is meaningless to livestock and meat trade unless the sanitary concerns of the importing country are satis-

fied. Consistent with the principle specified by NAFTA and the World Trade Organization that sanitary and phytosanitary standards should be applied on a regional level, when possible, the NAFTA countries have sometimes allowed livestock and meat imports from areas that are free of problematic animal diseases, even if the disease in question is present in other parts of the exporting country. For example, sanitary concerns have traditionally limited Mexico's ability to export pork and poultry to the United States. In the future, such exports may grow to significant quantities, as the United States has recognized Mexican advances in controlling Classical Swine Fever and Exotic Newcastle Disease on a regional basis. Mexico is already an important supplier of pork to Japan, where sanitary standards are tightly defined and strictly enforced.

The discoveries of Bovine Spongiform Encephalopathy (BSE) in Canada and the United States in 2003 and 2004 have presented a serious challenge to integration. Under normal conditions, the cattle and

beef sectors of these two countries are tightly integrated, with production systems that cross international boundaries, important foreign investments, and substantial two-way trade in both cattle and beef. At present, there is an almost complete worldwide ban on imports of U.S. and Canadian cattle, but the NAFTA countries now allow imports of U.S. and Canadian boneless beef from cattle less than 30 months of age. Such animals are considered to have a minimal risk of transmitting BSE. In 2004, U.S. beef exports to Mexico approached 107,000 metric tons, compared with 39,000 metric tons in 2003, despite an interruption in trade due to the BSE discovery in the United States.

Structural change has also accelerated integration. Restructuring in the U.S. pork industry, for instance, helped to set the stage for the complementary relationship between Canadian feeder pig production and U.S. finishing and slaughter activities. Beginning in the 1980s, many of the farrow-to-finish producers that traditionally populated the U.S. Corn Belt exited the



industry, to be replaced by larger operations specializing in finishing. Consolidation also has led to much larger packing and processing plants that use capacity more intensively. Feeder pigs from Canada are critical to maximizing the year-round use of these facilities. These structural changes

interacted with other factors that fostered Canadian hog production, including elimination of Canada's grain transportation subsidies and an exchange rate that favored Canadian exports during much of the 1990s.

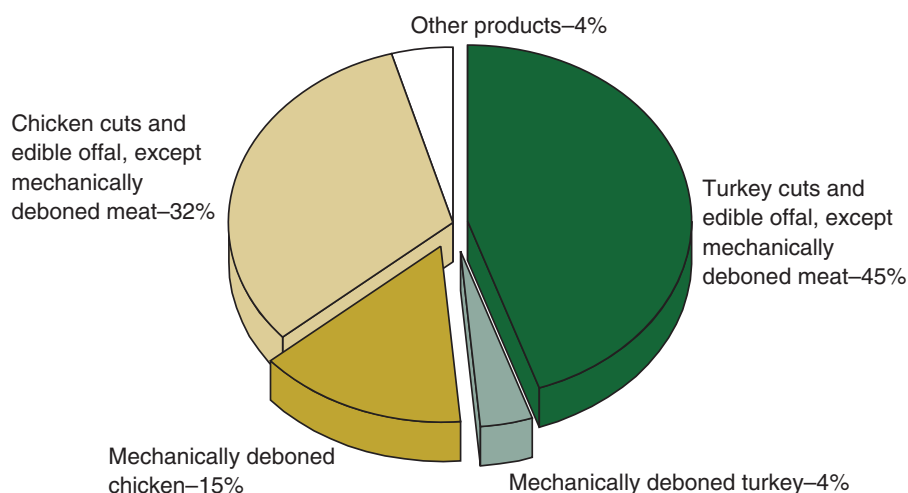
For Mexican hog producers, the opening of their market to competition from the United States and Canada coincided with heightened pressures to expand and consolidate. Although Mexican pork production has increased by more than 35 percent during the NAFTA period, imports accounted for about 27 percent of Mexican pork consumption in 2004, compared with 6 percent in 1996. Rising imports and economic restructuring have provided the context for several allegations of dumping concerning U.S. pork exports to Mexico, as well as the imposition of antidumping duties on U.S. hogs from early 1999 to May 2003.

The Mexican poultry industry also is undergoing significant internal changes. Three firms now account for about 60 percent of the industry's output and have captured the lion's share of consumption growth over the past decade. The largest of these producers is a Mexican firm, while the second- and third-largest are affiliates of U.S. corporations. Mexico's poultry industry has faced less direct competition from the United States than has its hog industry. About two-thirds of Mexican poultry imports from the United States consist of either turkey meat or mechanically deboned meat, neither of which is produced in large quantities in Mexico. To give the Mexican poultry industry additional time to adjust to integration, a temporary tariff-rate quota for U.S. chicken leg quarters is in effect until January 1, 2008.

Imports Have Become More Important to Fruit and Vegetable Consumption

A key factor driving integration in North American fruit and vegetable markets has been a growing demand on the part of U.S. and Canadian consumers for year-round supplies of fresh produce. The share of imports in U.S. fruit and vegetable consumption has grown steadily since 1990. In 2003, imports from Canada

In 2003, about two-thirds of U.S. poultry meat exports to Mexico (in terms of value) consisted of commodities that Mexico does not produce in large quantities



Note: Total value of U.S. poultry meat exports to Mexico: \$317 million.

Source: Mexican Secretariat of Economy, as reported by *World Trade Atlas*.



and Mexico supplied about 12 percent of fresh or frozen vegetables and 7 percent of fresh or frozen fruit, up from 6 percent for both groups of commodities in 1990. Imports have also contributed to a shift away from processed fruits and vegetables and toward fresh produce. In 2003, fresh produce accounted for 47 percent of U.S. fruit and vegetable consumption, up from 44 percent in 1990.

Given Mexico's vibrant fruit and vegetable industry, it should not be surprising that Mexican exporters have been major beneficiaries from this trend. During the NAFTA period, Mexican fruit and vegetable exports to the United States have more than doubled, surpassing \$3.8 billion in 2004. But, surprisingly to some observers, Canada has emerged over the past decade as an important supplier of fresh tomatoes, peppers, and mushrooms, in addition to fresh and frozen potatoes, to the U.S. market. This phenomenon has occurred thanks to the broader application of greenhouse technologies in Canada, along with the completion of U.S.-Canada trade liberalization for fruits and vegetables in 1998.

U.S. produce is already important in Canada and is becoming more so in Mexico. Because of Canada's cooler climate,

*During the NAFTA period,
Mexican fruit and vegetable
exports to the United States
have more than doubled . . .*

U.S. producers have been active in the Canadian market for some time, with fruit and vegetable exports to Canada exceeding \$3 billion in 2004. Elimination of the remaining tariffs on U.S.-Canada trade has given Canadian consumers tariff-free access to the full range of U.S. produce—facilitating the growth in U.S. exports of strawberries, cherries, pears, carrots, lettuce, and potatoes. U.S. participation in the Mexican market is smaller, but the rapid expansion of the Mexican supermarket sector is helping U.S. producers, many of whom have well-established procurement relationships with retailers operating in Mexico. Apples, pears, and grapes are currently the leading U.S. produce exports to Mexico.

Producer groups have played an important role in the integration of the continental market. For example, produce

companies from each NAFTA country have formed the Fruit and Vegetable Dispute Resolution Corporation. This private, non-profit organization has created a multistep dispute resolution system that begins with preventive activities and cooperative problem-solving and then proceeds gradually to more binding measures. In addition, producer groups have successfully used negotiations to address dumping allegations. In cases involving U.S. apple exports to Mexico and Mexican tomato exports to the United States, producer groups have agreed to the suspension of the antidumping investigations for long periods in exchange for a minimum price for the commodity in question. Compared with the imposition of prohibitive antidumping duties, such agreements are likely to facilitate higher volumes of trade at lower prices, thereby improving consumer welfare. Suspension agreements, however, address only a small fraction of the trade remedy cases concerning agricultural trade within North America.

Integration Also Encompasses the Processed Food Industry

Integration is not limited to production agriculture. North America's processed food industries are increasingly interwov-

en, and integration between Canadian and U.S. food processors has reached a particularly advanced stage. Canada-U.S. integration takes place through substantial direct investment in each other's industry, as well as large and growing flows of intra-industry trade in a variety of intermediate and final food products, including mixes, dough, bread, cookies, pastries, pet food, and confectionery products.

Similar linkages connect Mexico and the United States, but these investment and trade flows are much smaller relative to Mexico's population. Further increases in per capita income in Mexico, along with additional improvements to the country's transportation and retail systems, are likely to advance the integration of U.S. and Mexican processed food markets. In the meantime, one processed item, beer, is Mexico's leading agricultural export, with sales to the United States approaching \$1.2 billion in 2004.

U.S. firms undertake most of the foreign direct investment in the North American processed food sector. In 2003, the stock of U.S. direct investment in the Canadian and Mexican food industries (excluding beverages and production agriculture) equaled \$4.3 and \$1.7 billion, respectively. In contrast, the stock of Canadian and Mexican direct investment in the U.S. processed food industry was about \$1.1 billion each. Sales associated with these investments are substantial. In 2002, majority-owned affiliates of U.S. multinational food companies had sales in Canada and Mexico of \$14.5 and \$6.7 billion, respectively. Together, these amounts were 136 percent larger than U.S. processed food exports to Canada and Mexico.

Further Integration Is Possible

With the completion of NAFTA's implementation less than 3 years away, many are thinking about additional steps that could facilitate further integration. All

three NAFTA countries are actively pursuing additional free trade agreements with other countries. The 3 countries are among 34 democracies in the Western Hemisphere that are negotiating a Free Trade Area of the Americas, and each of the 3 has completed or is negotiating free-trade agreements with countries outside NAFTA. Each NAFTA country now has a free-trade agreement with Chile, an outcome that is similar to what would have resulted had Chile formally joined NAFTA. The NAFTA countries are also seeking meaningful agricultural trade reforms through multilateral negotiations at the World Trade Organization.

Two smaller efforts tailored specifically to agriculture could also increase market integration. The first concerns the application of trade remedies, such as antidumping duties and countervailing duties. Although NAFTA created a dispute-resolution mechanism in which national trade remedy decisions can be appealed before NAFTA arbitration panels, the agreement generally preserves the autonomy of each member country to implement its own trade remedy laws. Given that commodity prices are volatile and sometimes fall below the costs of production, some observers have suggested that the current approach to allegations of dumping is inappropriate for agriculture, especially since the North American countries have already removed numerous obstructions to regional trade and investment. Canada and Chile have pursued an innovative course with respect to trade remedies by exempting all of their bilateral trade from antidumping duties, as part of the Canada-Chile Free Trade Agreement.

The second area in which smaller constructive efforts could advance market integration is regulatory coordination. Over the past decade, the NAFTA countries have fine-tuned many of their sanitary and phytosanitary measures so that they do not unnecessarily hinder trade.

These efforts have paid off in numerous small reforms that have opened doors to new trading opportunities, and additional efforts in this area are likely to have beneficial effects as well. Through the Security and Prosperity Partnership of North America, signed by the leaders of the NAFTA countries in March 2005, the governments of North America have made a commitment to an even more ambitious agenda of regulatory coordination, featuring common approaches to food safety, greater coordination and information-sharing among testing laboratories, and increased cooperation with respect to the regulation of agricultural biotechnologies. Achieving these objectives will require a high degree of cooperation and coordination among the three governments, and the partnership is likely to serve as a model for similar endeavors in the future. *W*

This article is drawn from . . .

NAFTA at 11: The Growing Integration of North American Agriculture, edited by Steven Zahniser, WRS-05-02, USDA, Economic Research Service, February 2005, available at: www.ers.usda.gov/publications/wrs0502/

Market Integration in the North American Hog Industries, by Mildred Haley, LDP-M-125-01, USDA, Economic Research Service, November 2004, available at: www.ers.usda.gov/publications/ldp/nov04/ldpm12501/

Market Integration of the North American Animal Products Complex, by William Hahn, Mildred Haley, Dale Leuck, James Miller, Janet Perry, Fawzi Taha, and Steven Zahniser, LDP-M-131-01, USDA, Economic Research Service, available at: www.ers.usda.gov/publications/ldp/may05/ldpm13101/

U.S.-Mexico Corn Trade During the NAFTA Era: New Twists to an Old Story, by Steven Zahniser and William T. Coyle, FDS-04D-01, USDA, Economic Research Service, May 2004, available at: www.ers.usda.gov/publications/fds/may04/fds04d01/

Obesity Policy and the Law of Unintended Consequences

Fred Kuchler, fkuchler@ers.usda.gov

Elise Golan, egolan@ers.usda.gov

Jayachandran N. Variyam, jvariya@ers.usda.gov

Stephen R. Crutchfield, scrutch@ers.usda.gov

Americans are increasingly overweight, with the number of obese adults and overweight children doubling between the late 1970s and early 2000s. Several studies of the health consequences of Americans' weight gain indicate that health care costs and the number of premature deaths associated with obesity and overweight are high. A recent (lower) estimate of the number of premature deaths published in the *Journal of the American Medical Association* reveals the uncertainty researchers face in associating weight status with mortality. Of course, scientific uncertainty does not mute demands for public action.

The New York Times

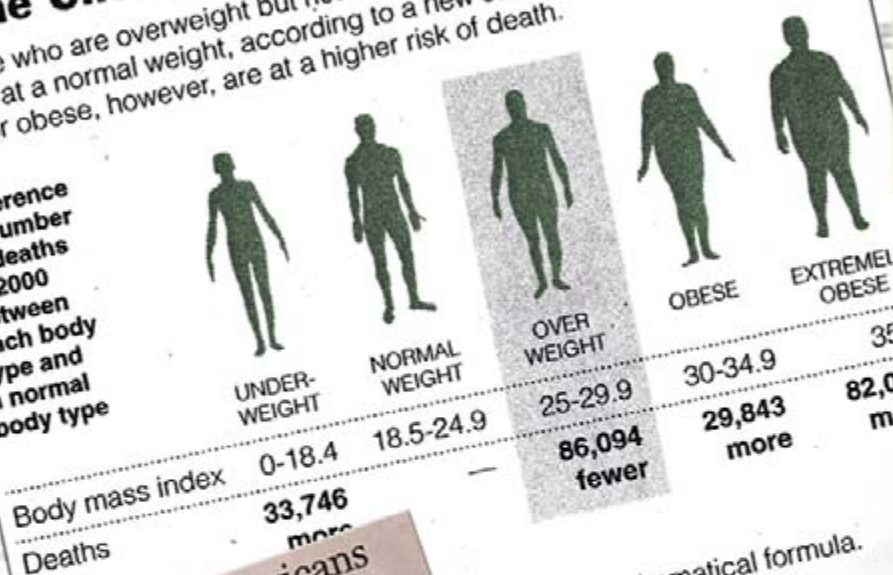
The Year of Obesity

Our perennial interest in losing weight became a national obsession in 2004

Some Unexpected

People who are overweight but not obese have a lower risk of death than those at a normal weight, according to a new study. Those who are thin or obese, however, are at a higher risk of death.

Difference in number of deaths in 2000 between each body type and a normal body type



Today one-third of Americans are not just overweight but obese. That's why the issue got more attention in 2004 than ever before from health experts, government agencies and the media—including TIME and ABC

Body Fat a Key to Reducing Risk Factors in Obese Men

Overweight or obese men must decrease their body fat, no matter how physically fit they are, to avoid having risk factors of cardiovascular disease, according to a new study in the journal.

Researchers at the University of Colorado at Boulder found that, in men, the amount of body fat is a predictor of cardiovascular risk factors such as high blood pressure and abnormal clotting. Aerobic fitness

Dr. Mark Mattson, a rail-thin researcher at the National Institute on Aging who is an expert on caloric restriction as a means of prolonging life, said it was not clear that eating fewer calories meant weighing less, since some people eat very little and never get so thin. In any case, while caloric restriction may extend life, Dr. Mattson said, "there's certainly a point where you can overdo it with caloric restriction, and

Some warn that obesity is still a major health concern.

don't know what that point is."

Some statisticians and epidemiologists said that the study's methods and data were exemplary and the authors — Dr. Williamson K. M. Flegal of the disease control centers, and Dr. Barry Graubard and Dr. Mitchell H. Gail of the cancer institute — were experienced and highly regarded scientists.

Americans flocked to see *Super Size Me*, Morgan Spurlock's documentary about what happens when you eat nothing but McDonald's food for a month. Now McDonald's continues



Action to combat obesity and overweight could come in many forms since many variables influence diet and lifestyle choices. While economics tells us that prices and income shape choices, other factors are important, too. Individuals choose foods based on taste, convenience, family structure and traditions, age, health status, knowledge, and lifestyle. Policy targeted at any of these factors could have some success in reducing obesity and overweight. However, such success is likely to be limited if all other factors remain unchanged. The economic levers available to policymakers to create incentives for individuals to alter diet and lifestyle choices affect only some of the determinants of food choices.

The wide range of factors contributing to food choices is compounded by the incredible variety of foods and consumption opportunities available today—we make choices among thousands of food products, choices about whether to eat at home or in a variety of restaurants, and choices about lifestyles, such as diet quality and exercise. As a result of nearly unlimited choice, public policy targeting specific foods or lifestyle choices could have surprising unintended consequences. ERS has examined some of the potential intended

and unintended consequences of three widely discussed obesity policies—nutrition labels in restaurants, taxes on snack foods, and restrictions on food advertising to children—with a focus on the likely effect of each program on producer and consumer incentives and on health outcomes. In every case, the unintended effects could dampen the policy's success in reducing overweight and obesity.

Nutrition Labeling at Restaurants

The 1994 National Labeling and Education Act (NLEA) requires manufac-

turers to include a nutrition information panel on the label of almost all packaged foods, but it does not require any similar disclosure for foods purchased at restaurants—food-away-from-home (FAFH). The lack of nutrition information for FAFH means that if consumers misjudge the nutrient content of meals eaten out, they may inadvertently overconsume some nutrients and underconsume others. An ERS study showed that FAFH typically contained more of the nutrients overconsumed (fat and saturated fat) and less of the nutrients underconsumed (calcium,



Americans have a wide variety of food choices, including eating at home or away from home.

fiber, and iron) by Americans. Because FAFH commands a large and increasing share of total food expenditures, nutrition choices at FAFH could have a large effect on overall diet quality.

If consumers choose high-fat or high-calorie foods because they lack FAFH nutrition information, then mandatory FAFH labeling could potentially lead to improvements in consumers' food choices and health. However, lack of information may not be the reason for poor nutritional FAFH choices, either because the industry supplies enough information or consumers deduce the information (see box, "Is There Evidence That Obesity and Overweight Are the Result of Market Failure?"). In such cases, making standardized nutrition labels mandatory for major sources of FAFH such as fast food and chain restaurants will not improve public health.

Restaurants could also respond to mandatory labeling by expanding their menu options to include healthier choices.

Recent consumer choice studies suggest that the effect of nutritional information on diet in FAFH settings may be modest. For example, a Pennsylvania State University study of food intake among normal-weight women found that explaining the concept of energy density (amount of calories per gram of food) and providing nutrition information on labels during meals in a laboratory setting had no impact on subjects' energy intakes. A restaurant study in England found that providing nutrition information had no effect on overall energy and fat intake of patrons. In fact, the presence of "lower fat" information was associated with

fewer restaurant patrons' selecting the target dish. Another study in an Army cafeteria found no significant difference between sales before and after nutrition labeling for either average "healthy" (labeled, containing less than 15 grams of fat and 100 milligrams of cholesterol per serving) entrée sales or the proportion of healthy entrée to total entrée sales.

Even if consumers do not immediately respond to nutrition information, mandatory labeling could still lead to improvements in consumer health if the FAFH industry reacted by improving the nutritional quality of foods sold at restaurants. For example, a FAFH labeling policy requiring disclosure of the amount of calories, fat, sodium, and cholesterol could induce restaurants' selling products high in these ingredients to reformulate their product rather than risk losing sales to restaurants' selling nutritionally superior products. Such reformulation could alter the entire range of market offerings and precipitate better nutritional outcomes for all consumers. If consumers do not like these reformulations, restaurants will abandon them for recipes with the taste and texture that consumers prefer.

So far, the evidence on whether the 1994 act (NLEA) induced reformulation of foods consumed at home is mixed. One study that examined the snack cracker market found that the average fat content and the average share of calories from fat per serving were significantly lower in the post-NLEA period compared with the pre-NLEA period. However, an ERS study that analyzed the nutritional quality of five product categories before and after NLEA found little change.

Nutrition Facts		
Serving Size 1 cup (30g)		
Servings Per Container About 10		
Amount Per Serving	Berry Burst Cheerios	1/2 cup skim milk
Calories	110	150
Calories from Fat	15	15
% Daily Value**		
Total Fat 1.5g	2%	3%
Saturated Fat 0g	0%	0%
Trans Fat 0g		
Polyunsaturated Fat 0.5g		
Monounsaturated Fat 0.5g		
Cholesterol 0mg	0%	1%
Sodium 180mg	7%	10%
Potassium 100mg	3%	9%
Total Carbohydrate 24g	8%	10%
Dietary Fiber 3g	11%	11%
Soluble Fiber less than 1g		
Sugars 10g		
Other Carbohydrate 11g		
Protein 3g		

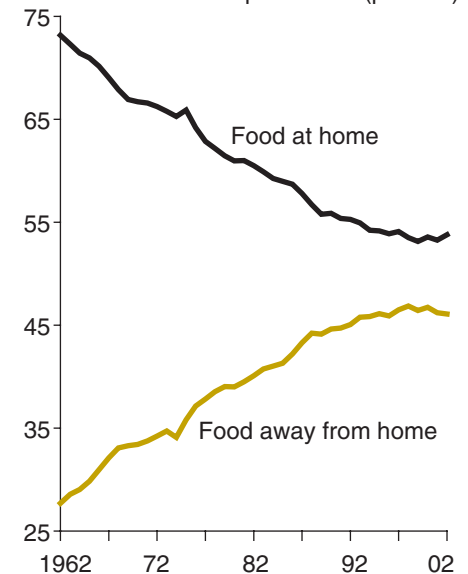
Since taste is usually linked to higher fat, salt, and sugar content, restaurateurs are likely to resist changing their recipes or formulating new ones unless many consumers start making different food choices. Or, restaurateurs could choose to reformulate away from one ingredient, like saturated fat, and compensate for flavor changes by boosting the sugar or salt content of the food. In this case, the overall nutritional content

of a restaurant meal may not improve. Meals that are marginally lower in one or more attributes may not be much healthier than the originals.

Restaurants could also respond to mandatory labeling by expanding their menu options to include healthier choices, while still selling or even promoting their less healthy options. In this way they could

Americans are eating out more

Share of total food expenditures (percent)



Source: Food Consumption (Per Capita) Data System, USDA, Economic Research Service.

Is There Evidence That Obesity and Overweight Are the Result of Market Failure?

Without evidence that food markets are failing to reflect consumer and societal preferences, food policy to curtail overweight and obesity could cause more harm than good. Three possible market failure scenarios are drawing the media's and policymakers' attention.

Scenario 1: Producers are not responsive to consumer demand and do not supply the types of food desired by consumers.

A business strategy that disregards consumer preferences is unlikely to succeed for long, particularly in today's food industry. Processing, storage, transportation, and communication technology have enabled food manufacturers to both gauge and satisfy the subtlest variations in consumer preferences.

The variety of food products (40,000 in the typical supermarket in 2000) on grocery store shelves reflects the industry's ability to adapt to consumer preferences—even short-lived or faddish ones. For example, at the height of the low-fat movement in 1996, manufacturers introduced 3,434 new “low-fat” or “nonfat” food products. In 2003, 700 “low-carb” or “no-carb” products hit the market and in 2004, 3,431 such products followed. Competition to attract and keep customers extends to the fast food and restaurant industries. Large portions and high-fat foods are one way to draw customers. “Healthy” foods such as salads, bunless burgers, and heart-healthy menu options are another.

Competition also extends to low-income consumers. In urban areas, Asian, Caribbean, Indian, and South American stores offer indigenous foods and produce for their customers, many of whom are low-income recent immigrants. Retailers are even courting low-income consumers with the emergence of “WIC-only” stores, exclusive to WIC participants. All in all, there is little evidence that the U.S. food industry is unwilling or unable to supply the types of foods that consumers desire.

Scenario 2: Consumers do not have enough information to make informed choices and inadvertently demand (and consume) diets high in calories.

The sheer volume of media coverage devoted to diet and weight makes it difficult to believe that Americans are unaware of the relationship between a healthful diet and obesity. In fact, results from USDA's Diet and Health Knowledge Survey indicate that most U.S. consumers have basic nutrition knowledge and that they can discriminate among foods on the basis of fat, fiber, and cholesterol. Most are aware of health problems related to certain nutrients.

One consumer information gap may involve perceptions of appropriate weight. ERS researchers found that 41 percent of individuals whom health professionals would classify as overweight, but not obese, did not perceive themselves to be overweight. Among individuals whom professionals would classify as obese, 13 percent said that their weight is about right or even too low. These misperceptions about

healthy weight may lead to misinformed consumption choices. But the facts admit an alternative explanation: the available information does not allow researchers to distinguish misinformed weight perceptions from informed disagreement with public health weight norms.

Another information gap may exist with respect to the nutritional quality of food sold at restaurants. For example, though savvy consumers may be able to infer that a dessert that does not have a “heart healthy” logo has more cholesterol or saturated fat than one with the logo, they cannot infer any information about sugar or calorie content. Restaurants offer foods high in fat and calories because these foods taste good, and they are not anxious to advertise their nutrition information for potentially skittish customers.

Do these limitations to nutrition disclosure at restaurants hinder the ability of consumers to make informed decisions? On the one hand, most consumers suspect that food served at fast food restaurants is not the healthiest. A 2003 Gallup Poll survey found that two-thirds of consumers thought that most food sold at fast-food restaurants was not good for them. On the other hand, consumers may not be able to precisely gauge the nutritional content of restaurant foods. A 1996 survey conducted by New York University and the Center for Science in the Public Interest found that even trained dietitians underestimated the calorie content of five restaurant meals by an average of 37 percent and the fat content by 49 percent.

Scenario 3: Consumers make poor diet choices because they do not bear all the health costs of their choices.

Health insurance, both private and public, may reduce consumers' incentives to take all cost-justified health precautions (including choosing a healthy diet) because it reduces the medical costs paid directly by consumers. The fact that a large part of the health care bill from overweight and obesity is eventually footed by taxpayers, not private insurance providers, may further misalign social and private costs. Economists have estimated that Medicare and Medicaid pay for at least half of obesity-attributable medical expenses. What would otherwise be a matter of personal choice (and responsibility) becomes a matter of concern for all taxpayers.

Of course, Americans' rapid weight gain may have nothing to do with market failure. It may be a rational response to changing technology and prices. Technological change has created a largely sedentary workforce, so workers have to exercise more outside of work or reduce their caloric intake to maintain weight. In addition, frozen microwavable meals and the like have reduced the time cost of preparing meals, encouraging consumption. Medical technology in the treatment of obesity-related illnesses has also improved, turning some hopeless situations into chronic illnesses and, from the perspective of the obese, reducing the health costs of obesity. So, if consumers willingly trade off increased adiposity for working indoors and spending less time in the kitchen as well as for manageable weight-related health problems, then markets are not failing.

satisfy their nutritionally conscientious customers without alienating their customers who prefer higher fat or caloric foods. This strategy could lead to unintended outcomes for nutrition information policy. A study by Christine Moorman of Duke University showed that following NLEA, food suppliers expanded price promotion of nutritionally poorer brands while promotion of nutritionally better brands did not change significantly between the two periods.

A Tax on Snack Food

Another proposal to reduce obesity in the United States is a tax on snack foods that are high in salt, added sugar, fat, and calories. As consumers substitute healthier foods, their weight would fall and their health would likely improve. (Some variations of this proposal would use revenues raised from the tax to fund expanded nutrition education programs.)

Selective taxation of particular foods is rare for the Federal Government. Oleomargarine was taxed from 1886 until 1950, and during two periods in the early part of the 20th century, the Federal Government taxed soft drinks. Thus, a Federal snack food tax would be novel from a fiscal perspective.

For those consumers who are not overweight and enjoy snack foods, there are only costs associated with the tax. They would either pay the tax on their favorite snack foods or choose a less satisfying diet. Also, excise taxes on food tend to be regressive—the burden of the tax would likely fall disproportionately on low-income consumers, who spend more



As consumers substitute healthier foods, their weight would fall and their health would likely improve.

of their income on food than do middle- or upper-income consumers.

The health benefits of the tax depend on how big an incentive the tax is for consumers to avoid taxed foods and make better dietary choices. Imposing the tax may not create a strong incentive for consumers to make changes. First, to influence consumer choices, the tax must be passed on to retail consumers. Sometimes manufacturers absorb the

entire tax, leaving retail prices and consumers' behavior unchanged. If snack food companies operate in competitive markets, the tax would be passed on to consumers because the companies are paying competitive prices for their inputs and cannot push the tax onto suppliers. When food suppliers have some ability to set prices, the relation between taxes and retail prices is less direct.

Second, the tax base—the foods that are taxed—has to be sufficiently broad to induce better choices. The tax base has to include nutritionally equivalent foods, however infrequently the latter are consumed. No benefits accrue if the tax simply induces substituting one snack food for another—pork rinds for potato chips. Many economists have studied demands for broad classes of foods (for example, substitution among beef, pork, chicken, and fish). How consumers might substitute away from particular types of highly processed food is not yet clear. Tax proponents might hope that consumers would substitute fruit and vegetables for snack food.



Third, consumers would have to respond to changes in retail prices. Looking at household expenditures in relation to income reveals that consumers are unlikely to be greatly influenced by a tax. Household expenditures on the entire class of salty snack foods (chips, nuts, pretzels, cheese puffs, and popcorn) are for most households about 0.1 percent of annual income. Consumers are not likely to pay much attention to changing retail prices for small expenditures. Other goods, like homes and cars, will command much more of their interest in prices.

ERS research estimating household demand for snack foods confirms that salty snack foods are not very responsive to prices. Estimated price responsiveness was similar in magnitude to that found in other empirical research for cigarettes and alcoholic beverages. That is, price increases may reduce purchases, but the reduction will be much smaller than the tax-induced price increase. A relatively small tax on snack food, say 1 percent, would have vanishingly small impacts on dietary choices and thus negligible impacts on weight or health. Since calculations were made under the assumption that the entire tax would be passed forward, the actual impacts may be smaller still.

Higher tax rates, say 30 percent, appear to influence consumer food choices

If children were no longer exposed to frequently repeated advertisements, other foods could compete for their attention.

and weight so long as the tax base is broad. But such results are tentative since the full range of consumer substitution possibilities is difficult to model and may not correspond to previously observed consumption patterns.

Curtail Food Advertising, Particularly to Children

Some health researchers and health policy activists have recommended placing restrictions on food advertising. Some have proposed eliminating ads for candy, soft drinks, fast foods, and sugared cereal aimed at children. Proponents argue that these restrictions will help improve children's health. If children were no longer exposed to frequently repeated advertisements, other foods could compete for their attention. The effectiveness of a policy curtailing food advertising to children depends on the extent to which food ads alter children's preferences for different

food groups or simply shift them from one hamburger chain (and one toy) to another. If advertising is effective at forming children's food tastes and preferences, health benefits may accrue from minimizing children's exposure to advertising.

The food industry spends enormous amounts on advertising; however, it is not clear to what extent these expenditures increase overall calorie consumption or how much consumption would drop if advertising expenditures were curtailed. Little direct evidence links food advertising and overall diet quality. Studies that link the demand for individual food products and advertising are legion—many show that advertising does increase sales, and some show that advertising is cost-effective. Even generic advertising studies usually show demand increases in response to such expenditures. But, because food encompasses many products and varieties, increasing demand for one food or even a class of foods says very little about overall diet quality.

Evidence from the cigarette industry—where advertising has been restricted—offers some insights. Numerous studies, though ongoing, largely conclude that aggregate cigarette advertising has a small or negligible impact on overall cigarette smoking. Promotional expenditures sway consumers from one cigarette brand to another, leaving the number of smokers and the number of cigarettes smoked unchanged. If advertising affects food consumers similarly, then restrictions on food advertising may have a larger impact on brand choices than on overall food groups consumed or diet quality. Food markets, for the most part, have stable aggregate demand, and advertising levels are strategically used to maintain market or brand share.

Additional evidence from cigarette market studies suggests, however, that advertising effects may be different for children. Cigarette advertising is effective

Salty snack consumption and expenditures, 1999				
Snacks	Share of households that purchased snacks	Average quantity purchased by households that did pur-	Per capita quantity purchased by households	Household expenditure by households that did pur-
Potato chips	91.3	9.76	4.18	26.14
All chips	95.5	16.34	7.00	41.43
Other salty	96.8	16.47	7.92	37.41
All salty snacks	99.2	31.81	14.47	76.39
Source: Tabulated by ERS from ACNielsen Homescan panel, 1999.				

in getting children's attention, and children's recall of the ads is correlated with smoking behavior or initiation. For children, cigarette advertising may be more inducement than brand identification.

Potential benefits of restricted food advertising could be complicated in that across-the-board restrictions could result in lower prices and increased consumption of foods bearing the advertising restriction. Some studies found that aggregate cigarette consumption actually increased after the U.S. banned broadcast cigarette advertising. Cigarette companies, no longer allowed to compete through broadcast commercials, were forced to compete more on price, and were able to do so from advertising savings. If restrictions on food advertisements have similar effects on price and consumption, then Americans could end up fatter, not fitter.

Can Policies Reduce Obesity Rates?

Weight status—underweight, healthy weight, overweight, or obese—is, for most people, an outcome of personal choices: what and how much to eat and whether and how much to exercise. Changes in habits are possible—recent statistics from the Centers for Disease Control and Prevention indicate that former smokers now outnumber smokers. Furthermore, habits would not have to change drastically to lead to reclassifying the weight status of most Americans. The American Dietetic Association says that each additional 3,500 calories a person consumes results in an additional pound of body weight. That implies that a person who gave up 100 calories (equivalent to a piece of toast) each day for a year would end up approximately 10 pounds lighter at year's end.

The list of policies that could potentially help Americans turn the corner on obesity and overweight is as long as the list of factors that influence an individual's diet and lifestyle choices. The list of unin-



tended consequences stemming from obesity policy is probably longer. Even the most apparently straightforward policy proposal can have surprising effects: mandatory nutrition information at fast food restaurants could lead to reformulations or price promotions that do not necessarily contribute to healthier diets; taxes on snack foods could lead some consumers to substitute equally unhealthy foods for the taxed food; and restrictions on food advertising could ultimately lead to lower prices for food subject to the restrictions. Food policy overflows with unintended consequences. The trick is making sure they do not overwhelm the intended ones. **W**

This article is drawn from . . .

"Is There a Role for Government in Reducing the Prevalence of Overweight and Obesity?" by Fred Kuchler and Elise Golan, *Choices*, Fall 2004: 41-45, available at: www.choicesmagazine.org/2004-3/obesity/2004-3-03.htm

Nutrition Labeling in the Food-Away-From-Home Sector: An Economic Assessment, by Jayachandran N. Variyam, ERR-4, USDA, Economic Research Service, April 2005, available at: www.ers.usda.gov/publications/err4/

"Societal Costs of Obesity: How Can We Assess When Federal Interventions Will Pay?" by Fred Kuchler and Nicole Ballenger, *Food Review*, USDA, Economic Research Service, 25(3) December 2002: 21-27, available at: www.ers.usda.gov/publications/foodreview/dec2002/frvol25i3e.pdf

Taxing Snack Foods: What To Expect for Diet and Tax Revenues, by Fred Kuchler, Abebayehu Tegene, and J. Michael Harris, AIB-747-08, USDA, Economic Research Service, August 2004, available at: www.ers.usda.gov/publications/aib747/aib74708.pdf

"The Price is Right: Economics and the Rise in Obesity," by Jayachandran N. Variyam, *Amber Waves*, USDA, Economic Research Service, Volume 3, Issue 1, February 2005, available at: www.ers.usda.gov/amberwaves/february05/features/thepriceisright.htm

Why Hasn't Crop Insurance Eliminated Disaster Assistance?

Robert Dismukes
dismukes@ers.usda.gov

Joseph Glauber
jglauber@oce.usda.gov

Agricultural production is inherently risky. Poor weather, pests, and diseases can reduce production levels. Americans have long supported government aid to farmers and ranchers facing such adverse events, though the best form of assistance has been open to debate. During the 1970s, standing disaster legislation protected major field crop producers who were enrolled in commodity programs. The Federal crop insurance program operated largely as a pilot program available for producers of selected crops in selected counties. In 1980, Congress passed the Federal Crop Insurance Act to strengthen the crop insurance program with the goal of replacing the costly disaster assistance programs.

Since then, the U.S. Government has promoted crop insurance over disaster payments as a primary risk management tool. From the outset, policymakers recognized that participation—the purchase of crop insurance policies by producers—



would be key, so they included premium subsidies of up to 30 percent in the 1980 Act. When signups remained low, Congress passed legislation in 1994 and 2000 to raise subsidy levels and provide other incentives to participate.

As a result, 80 percent of eligible acreage was enrolled in crop insurance by 1995. Still, Congress has continued to pass *ad hoc* disaster assistance measures in reaction to drought and other adverse events. Since 2000, four such programs have been authorized, covering 6 crop years for a total cost of about \$10 billion. Citing these instances, the Bush Administration is calling for reforms that would require all commodity program participants to buy crop insurance. Whether these reforms would reduce the need for disaster assistance is uncertain.

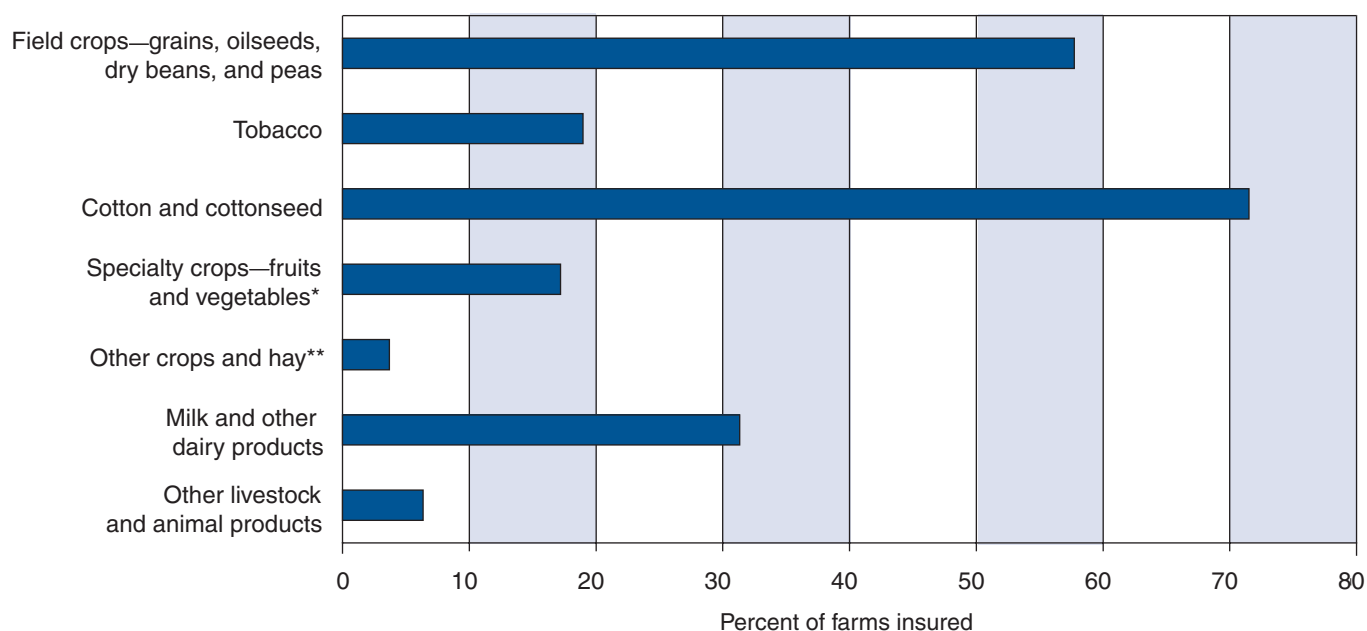
Crop Insurance Participation Can Be Measured in Several Ways

Participation can be defined as share of farms, eligible acres, or total crop value. In 2002, according to USDA's Agricultural Resource Management Survey (ARMS), only 16 percent of U.S. farms purchased crop insurance. However, according to other USDA data, 75 to 80 percent of eligible acreage was insured, and about 41 percent of the total U.S. crop value (or 46 percent excluding hay and forage) was insured over 2002-04.

What accounts for such differences? For one thing, more than half of U.S. farms (1.2 million out of 2.2 million farms) are livestock farms, and only about 8 percent of livestock farms purchased crop insurance. (The Federal crop insurance program recently added pilot programs to insure certain types of livestock operations, but only about 1,000 policies were sold in



Crop insurance participation is highest among field crop and cotton farms



* Includes tree nuts, berries, melons, and potatoes. ** Includes nursery, greenhouse, and floriculture.

Source: USDA's Agricultural Resource Management Survey, 2002.

2004.) In contrast, almost 28 percent of crop farms purchased crop insurance.

Among crop farms, crop insurance participation is most common among field crop producers. According to the 2002 ARMS, nearly 58 percent of farms that earned most of their income from grains, oilseeds, dry beans, or peas purchased crop insurance. Nearly 72 percent of cotton farms were insured, but less than one in five specialty crop producers purchased crop insurance.

Why do so few producers purchase insurance? Farm size and the importance of farm income to total household income are key considerations. Only 6 percent of the 1.3 million farms classified as *rural residence farms* (whose operators earn most of their income from nonfarm sources) purchased crop insurance in 2002. Such farms account for about 63 percent of U.S. farms, but less than 10 percent of agricultural production. Crop production on these farms is so minimal that off-

farm income likely provides the households with adequate risk protection.

When farm income accounts for more of total household income, the share of farms that purchases crop insurance increases. About 30 percent of *intermediate farms*—farms with annual sales of less than \$250,000 whose operators report farming as their principal occupation—were insured in 2002. Crop insurance participation increases to almost 42 percent among *commercial farms*—those with a minimum of \$250,000 in annual sales. Commercial farms account for less than 9 percent of farms but 70 percent of output.

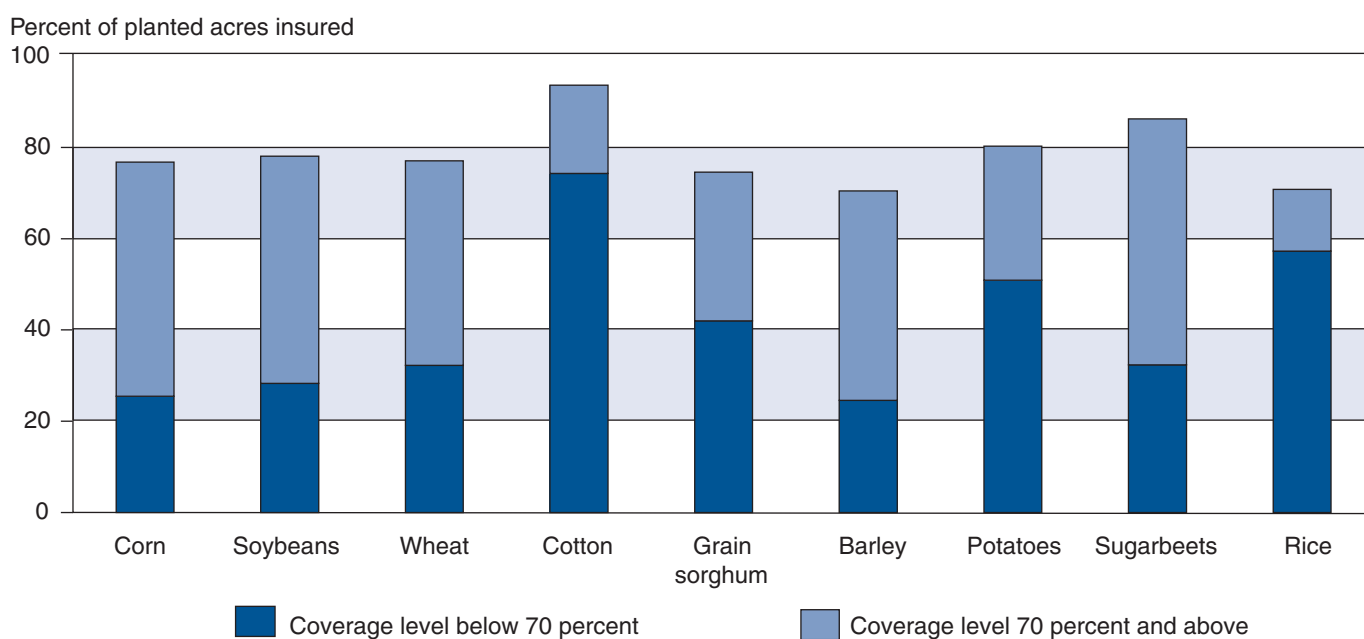
Thus, while participation rates among producers are relatively low, more than 220 million acres of crops were insured in 2004. This included 75-80 percent of corn, soybean, wheat, and cotton acres, with over half of the area insured at coverage levels of 70 percent and higher.

Efforts To Increase Participation Have Required Premium Subsidies

Historically, the Government has attempted to boost participation in crop insurance by subsidizing the insurance premiums. Under the 1980 law, which greatly expanded insurable crops, premium subsidies of up to 30 percent were offered. Still, growth in participation was sluggish. By 1994, less than 40 percent of eligible acreage was enrolled in the program, and Congress had passed *ad hoc* disaster assistance totaling nearly \$11 billion.

In an attempt to boost crop insurance participation, the Crop Insurance Reform Act of 1994 introduced a 100-percent premium subsidy on a minimal coverage level, called CAT for catastrophic coverage. The Act also increased premium subsidy rates on coverage levels above CAT, called *buy-up*, or *additional*, coverage (see box, "Insurance Plans and Coverage Levels").

Large shares of cotton and rice acres are insured at low coverage levels



Source: USDA's Risk Management Agency, participation data, 2004, and USDA's National Agricultural Statistics Service, acreage data.

Insurance Plans and Coverage Levels

Each year, producers decide whether to buy crop insurance, and, if so, how much and what type—individual farm yield, area yield, farm-level revenue, or area revenue.

- Individual farm-yield insurance, most often actual production history (APH) insurance, has been offered since the 1980s. It is sometimes called traditional crop insurance.
- Area-yield insurance, called group risk plan and introduced in 1995, bases coverage on the overall yield in a farmer's county.
- Revenue insurance products, widely available for major field crops, include crop revenue coverage, revenue assurance, and income protection. These farm-level revenue insurance products were introduced in 1996 and 1997.
- An area-revenue product, group risk income protection, was introduced in 2000.

The coverage levels are proportions of expected yield or revenue. For example, 70-percent coverage means that the producer is guaranteed 70 percent of his or her expected yield or revenue. Expected yield under the most common type of yield insurance is calculated as the producer's average yield over the previous 4-10 years, depending on available data. If, for instance, the producer's historical average corn yield is 140 bushels, 70-percent coverage means the insurance guarantee is 98 bushels. The same expected yield is used to establish revenue insurance coverage. To calculate expected revenue, the expected yield is usually multiplied by an average price during a pre-planting period for a harvest period futures contract. Under most revenue insurance policies, a producer's guarantee can increase if the harvest period futures price increases late in the growing season.

The range of coverage levels extends from the CAT (for catastrophic) coverage level—50 percent of expected yield, indemnified at 55 percent of expected price—to 85 percent of expected yield, indemnified at 100 percent of expected price, or 85 percent of expected revenue. Coverage levels available on area (county average), yield, and revenue policies extend to 90 percent.

CAT coverage, introduced in 1994, is offered to producers for a flat administrative fee of \$100 per crop, with the premium paid by the government. For coverage above CAT, called buy up, or additional, producers pay a fee (\$30 per crop) plus a portion of the premium. The proportion of the buy-up premium that is subsidized varies by coverage level, declining as coverage increases. The premium subsidy rates that took effect with the 2001 crop year are 59 percent of the total premium at the 65- and 70-percent coverage levels, 55 percent at the 75-percent level, 48 percent at the 80-percent level, and 38 percent at the 85-percent level.

If, at the end of the growing season, a producer's actual yield or revenue is below the insurance guarantee, due to an insured cause, the producer is paid an indemnity. The indemnity is the difference between the guarantee and the actual yield or revenue. In the case of yield insurance, the indemnity payment is made based on the "price election" (forecasted price) made prior to planting. For example, if a producer with a 98-bushel-per-acre guarantee were only able to harvest 50 bushels per acre, the yield insurance policy would pay an indemnity on 48 bushels. If the price election were \$2.45 per bushel, the amount of the indemnity would be \$117.60 per acre (48 bushels times \$2.45 per bushel). In the case of the most common type of revenue insurance, the producer's revenue guarantee could have been \$277.34 per acre (98 bushels expected yield multiplied by an expected price of \$2.83). If at the end of the season the producer's revenue, a combination of actual yield and harvest-period price, were below \$277.34, the revenue insurance indemnity would pay the difference.

Ad hoc disaster legislation in 1998 and 1999 prompted Congress to add premium discounts in 1999 and 2000 to the existing premium subsidies. In 2000, Congress passed the Agricultural Risk Protection Act, which further increased crop insurance subsidy levels, particularly at high levels of coverage and for revenue insurance products. Insured acres increased to over 200 million acres (from 182 million in 1998), and producers have purchased higher coverage levels.

By 2004, premium subsidies totaled nearly \$2.5 billion and accounted for almost 60 percent of total premium costs. Subsidies have become an increasingly costly way of encouraging participation. When subsidies are offered or increased, they are applied to all insured acres—those already insured as well as additional acres. Following the 1980 Federal Crop Insurance Act, the number of acres insured and the subsidy cost grew moderately. Insured acres exceeded 100 million acres in the late 1980s and early 1990s, when recipients of disaster assistance were required to purchase crop insurance in at least one subsequent year. During 1981-94, the cost in additional premium subsidy per additional acre insured was \$3.31 in constant (2000) dollars. The Crop Insurance Reform Act of 1994 led to an increase in the marginal subsidy cost per acre insured to \$10.51. After the Agricultural Risk Protection Act of 2000, the marginal subsidy cost has averaged about \$26 per acre.

The Government has also mandated participation in crop insurance by linking it to other support programs. The 1994 Act required producers participating in price and income support programs to insure their crops at the CAT level. In 1995, crop insurance participation soared to over 80 percent of the eligible area. The coverage levels at which producers insured remained low, however. Over half of the area insured in 1995 was at the CAT level,

which drew a full premium subsidy. Moreover, many farmers were unhappy with the mandatory linkage to commodity programs, so Congress terminated linkage after 1 year. Subsequently, CAT participation began to decline.

Another issue affecting participation has been the availability of insurance providers. Although a government program, crop insurance is delivered to farmers by private insurance companies. To entice these companies to make crop insurance widely available, the Government offers a complex set of incentives and requirements. Companies are required to sell Federal crop insurance products at the Government-approved premium rates. If they choose to sell crop insurance in a State, they must insure any eligible producer in that State. In return, companies receive administrative and operating subsidies to reimburse delivery costs. They also share in

underwriting gains and losses on crop insurance policies. These subsidies add to the Government costs of providing crop insurance.

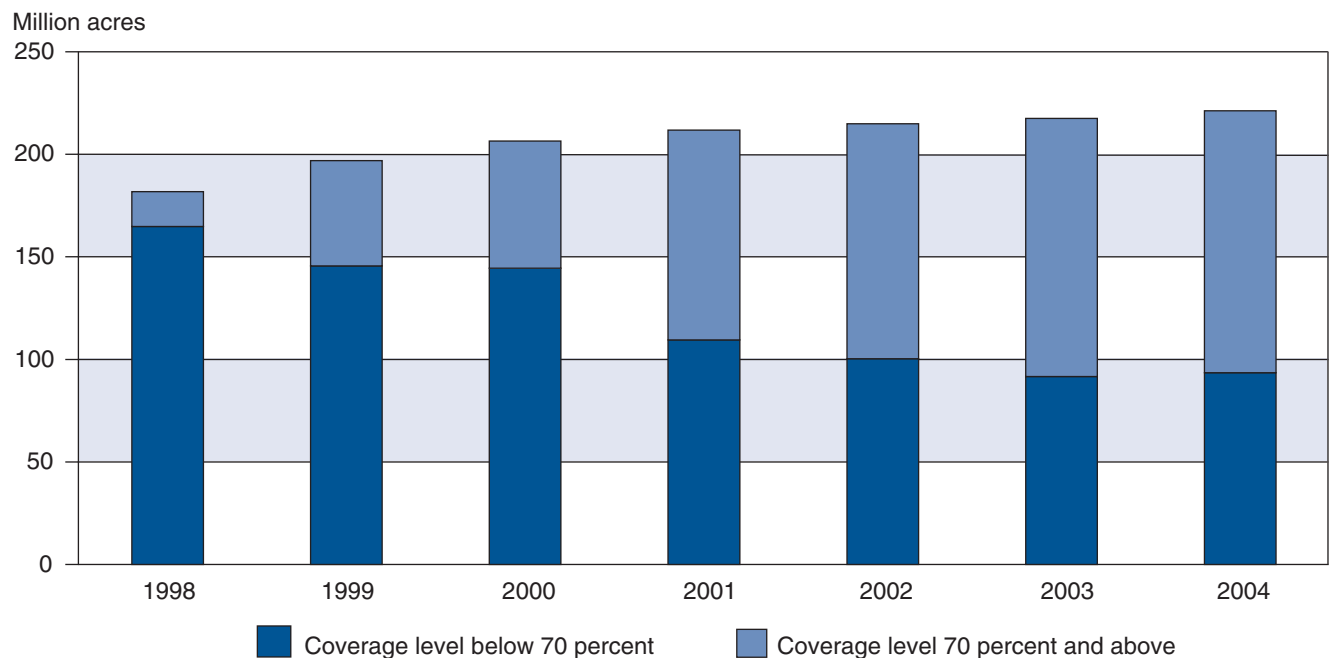
Do Producers Have Adequate Coverage?

While increasing the acres under crop insurance is one priority, there has also been a heated debate over whether insured producers have "adequate coverage." The coverage levels are proportions of expected yield or revenue. For example, 70-percent coverage means that the producer is guaranteed 70 percent of his or her expected yield or revenue. Expected yield is typically calculated as producer's average yield over the previous 4-10 years; expected revenue is the expected yield multiplied by the average price during a pre-planting period for a harvest-period futures contract. Many critics have point-

ed to the shortcomings of CAT coverage. Although CAT comes at little cost to producers, it provides little coverage: no insurance payment, or indemnity, on crop losses of up to 50 percent and a maximum indemnity of only 27.5 percent of expected revenue in the event of a total crop failure. Even coverage levels greater than CAT leave substantial portions of a producer's expected crop uninsured. At 70-percent coverage, for example, a farmer would have to suffer at least a 30-percent drop in expected yield or revenue in order to receive an indemnity, and any indemnity would restore revenue to only 70 percent of the expected level.

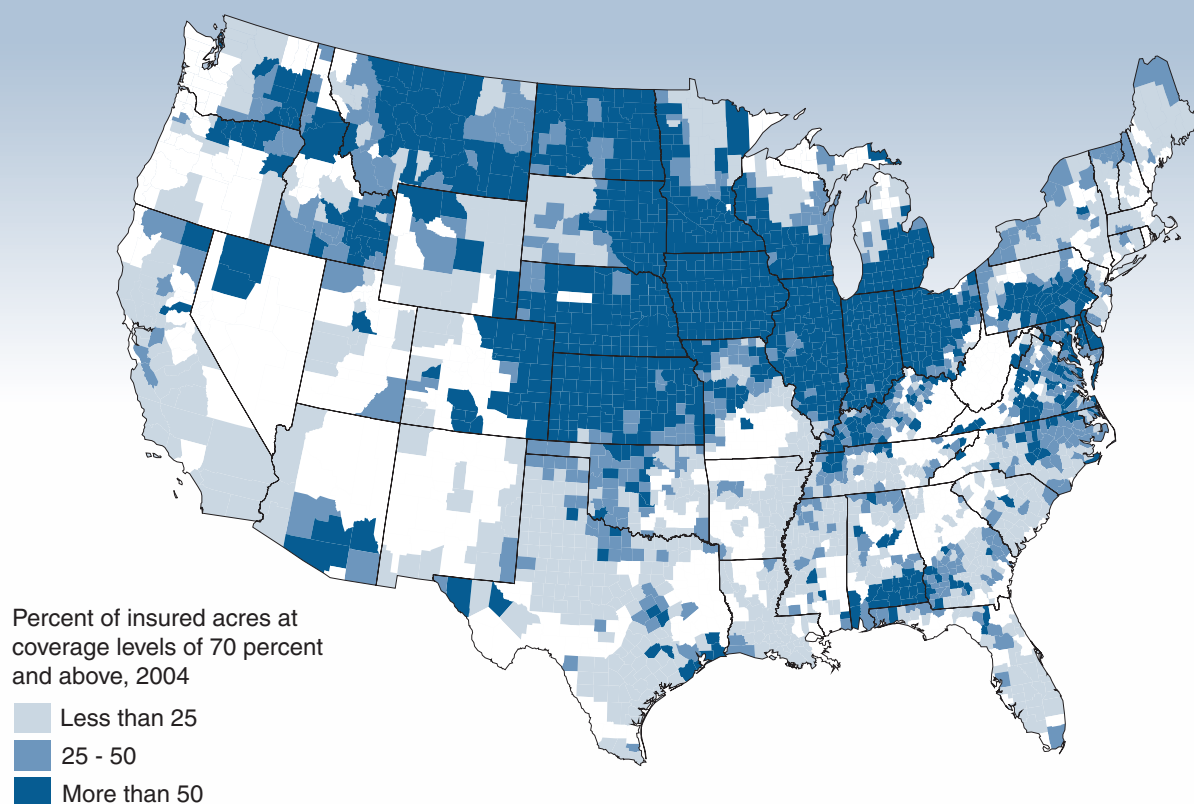
In the late 1990s, concerns about the adequacy of coverage led to legislation that increased the maximum coverage available from 75 to 85 percent and raised premium subsidies on higher coverage levels. The higher premium subsidy rates

Since 1998, producers have moved to higher coverage levels



Source: USDA's Risk Management Agency.

Most of the acreage in the Midwest and Northern Plains is insured at high coverage levels



Source: USDA's Risk Management Agency.

reduced costs to producers and increased the share of crop acres insured at higher coverage levels. In particular, the proportion of acres at 70-percent coverage or higher grew from about 9 percent in 1998 to about 60 percent in 2004.

The share of acres at 70-percent coverage and higher varies considerably by region. It is generally high in the Corn Belt and Northern Plains and low in the Southern Plains, Southeast, and West. In North Dakota, Iowa, Minnesota, and Kansas, top States in acres insured, more than two-thirds of the acres insured in 2004 were at the 70-percent coverage level or higher. In Texas, also among the top States in crop insurance acres, only 17 per-

cent of acres insured were at or above the 70-percent level.

Such differences in coverage levels likely derive from the price of insurance. Crop insurance rates, which depend on the riskiness of crop production and the type of insurance coverage, vary from region to region and from farm to farm. To compare premium rates across regions, analysts typically calculate the effective premium rate, or the total premium divided by liability for a standard coverage level and insurance type. ERS used the 65-percent coverage level for farm-level yield insurance as a standard and examined the relationship between the coverage levels chosen by producers and the premium

rates in a given area. In Texas, premium rates averaged 18 percent in 2004, versus about 4 percent in Iowa. Other Corn Belt States—Illinois, Ohio, and Indiana—with large shares of acres (67.7, 76.2, and 73.5 percent) insured at or above 70 percent had low premium rates (5.4, 6.9, and 6.3 percent), too.

Premium rates are not the sole explanation for coverage levels chosen. In North Dakota, over 65 percent of acres are insured at high coverage levels even though the effective premium rate is high (13.4 percent). In California, where large areas of cotton, rice, and specialty crops are insured, the premium rates are just 6 percent, but the share of acres

insured at or above 70 percent is low—about 17 percent.

As the riskiness of crop production, its effects on income, and farmers' ability to bear risk differ from farm to farm, so does the usefulness of crop insurance. In addition to crop insurance, farmers use other means to manage crop production risks, including irrigation, crop diversification, and drawing on savings or borrowing. Producers' perceptions of the relative costs and effectiveness of alternative risk management strategies may lead to different conclusions about the optimal level of insurance coverage.

Can Crop Insurance Replace Ad Hoc Disaster Assistance?

Currently, crop insurance participation—defined as insured acres as a percent of planted acres—is about 80 percent. Coverage levels at which producers are insuring are generally high. But coverage levels continue to be low in some regions

and for some crops. Thus, while most U.S. crop production is insured, pockets of inadequate protection raise the prospect of *ad hoc* disaster assistance.

Drought has been the source of the largest share of crop insurance indemnities. From 1989 to 2004, drought was listed as the primary cause of loss for about 40 percent of indemnities. Excessive moisture, rain, or flood accounted for about 30 percent, followed by frost, freeze or cold weather, and hail, each of which accounted for about 10 percent of indemnities.

Does crop insurance need to be strengthened for it to be the primary form of disaster aid to farmers and ranchers? The use of premium subsidies to encourage insurance participation and to raise coverage levels is costly. Additional subsidies are not likely to boost participation in large areas of the U.S. where it is already high.

The Bush Administration's proposal would mandate participation by linking it

to other farm program benefits. This requirement would likely bring more acres into the crop insurance program. However, cuts in subsidies may lead some producers to reduce their coverage levels. In the end, whether participation and coverage would be adequate to forestall future *ad hoc* disaster assistance legislation will depend on perceptions of coverage, the fiscal environment, and the political decisions of Congress and the Administration. **W**

This article is drawn from . . .

"Crop Insurance Reconsidered," by Joseph W. Glauber, *American Journal of Agricultural Economics*, Vol. 86, No. 5, pp. 1179-1195.

The ERS Briefing Room on Farm Risk Management, available at: www.ers.usda.gov/briefing/riskmanagement/



Data may have been updated since publication. For the most current information, see www.ers.usda.gov/publications/agoutlook/aotables/.

Farm, Rural, and Natural Resources Indicators

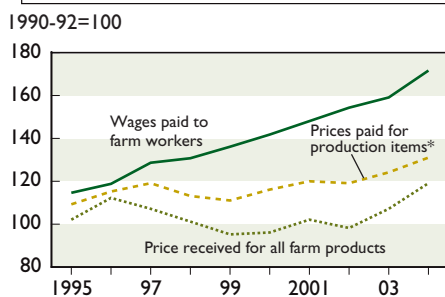
	1990	2000	2001	2002	2003	2004	Annual percent change		
							1990-2000	2002-03	2003-04
Cash receipts (\$ billion)	169.5	192.1	200.1	195.1	211.6	235.4f	1.3	8.5	11.2
Crops	80.3	92.5	93.4	101.3	106.2	113.2f	1.4	4.8	6.6
Livestock	89.2	99.6	106.7	93.8	105.5	122.2f	1.1	12.5	15.8
Direct government payments (\$ billion)	9.3	22.9	20.7	11.0	15.9	14.5f	9.4	44.5	-8.8
Gross cash income (\$ billion)	186.9	228.7	235.6	222.0	243.9	266.1f	2.0	9.9	9.1
Net cash income (\$ billion)	52.7	56.7	59.5	50.7	68.6	77.8f	0.7	35.3	13.4
Net value added (\$ billion)	80.8	91.9	94.1	78.8	101.4	118.0f	1.3	28.7	16.4
Farm equity (\$ billion)	702.6	1,025.6	1,070.2	1,110.7f	1,180.8	1,247.0f	3.9	6.3	5.6
Farm debt-asset ratio	16.4	14.8	14.8	14.8f	14.4	14.2f	-1.0	-2.7	-1.4
Farm household income (\$/farm household)	38,237	61,947	64,117	65,757	68,506	71,102f	4.9	4.2	3.8
Farm household income relative to average U.S. household income (%)	103.1	108.6	110.2	113.7	na	na	0.5	na	na
Nonmetro-Metro difference in poverty rate (%)	3.6	2.6	3.1	2.6	2.1	na	-3.2	-19.2	na
Cropland harvested (million acres)	310	314	311	307	315	312p	0.1	2.6	-1.0

Food and Fiber Sector Indicators

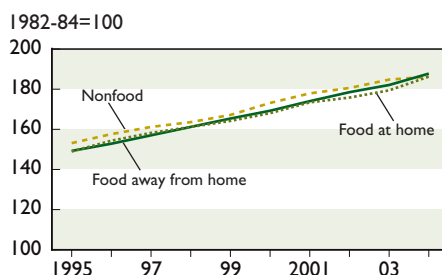
U.S. gross domestic product (\$ billion current) ²	5,803	9,825	10,082	10,446	10,863f	na	5.4	4.0	na
Food and fiber share (%)	15.1	12.6	12.3	na	na	na	-1.8	na	na
Farm sector share (%)	1.4	0.8	0.8	0.8	na	na	-5.4	na	na
Total agricultural imports (\$ billion) ¹	22.7	38.9	39.0	41.0	45.7	52.7	5.5	11.5	15.3
Total agricultural exports (\$ billion) ¹	40.3	50.7	52.7	53.3	56.2	62.3	2.3	5.4	10.9
Export share of the volume of U.S. agricultural production (%)	18.2	17.6	17.7	16.5	17.9	na	-0.3	8.5	na
CPI for food (1982-84=100)	132.4	167.9	173.1	176.2	180.0	186.2	2.4	2.2	3.4
Share of U.S. disposable income spent on food (%)	11.2	10.1	10.2	10.1	10.1	na	-1.0	0.0	na
Share of total food expenditures for at-home consumption (%)	55.4	53.3	53.9	53.8	53.1	na	-0.4	-1.3	na
Farm-to-retail price spread (1982-84=100)	144.5	210.3	215.4	221.2	na	na	3.8	na	na
Total USDA food and nutrition assistance spending (\$ billion) ¹	24.9	32.6	34.2	38.0	41.8	46.1	2.7	10.0	10.3

f = Forecast. p = Preliminary. na = Not available.

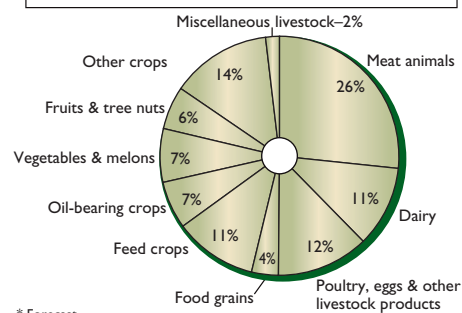
Prices paid and received by farmers



Consumer price indexes for food and nonfood items



Cash receipts from farming in 2005*



For more information, see www.ers.usda.gov/amberwaves/

Behind the Data

Population Interaction Zones for Agriculture

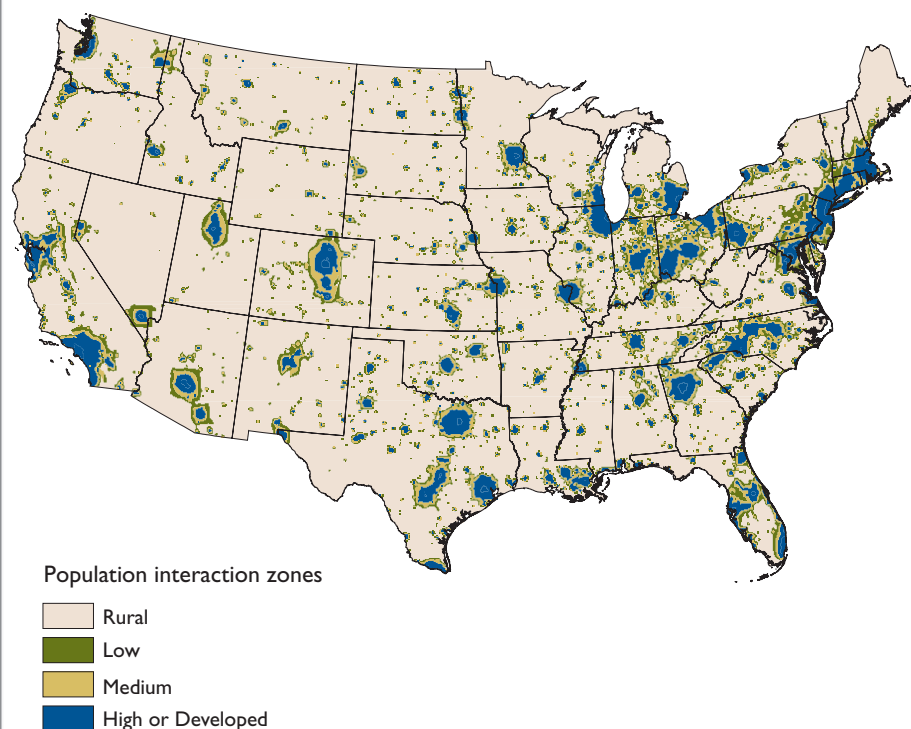
Widespread conversion of rural lands to urban uses is an issue challenging all levels of government. To provide policymakers with information useful for projecting future changes in land use, ERS has created a system to classify remaining farmland into “population interaction zones for agriculture” (PIZA). These zones represent areas of agricultural land use in which urban-related activities affect the economic and social environment of agriculture. In these zones, population interactions with farm production activities increase farmland value, change farm enterprises, and elevate the probability of conversion to urban-related uses.

Though closely related to the existing ERS county-level Urban Influence Codes and census tract-level Rural-Urban Commuting Area Codes, PIZA is a complementary system that provides codes for much smaller 5-kilometer squares. In addition, the PIZA codes provide a continuous and cardinal (rather than ordinal) measure of population interaction, which is especially useful for some analyses.

Designation of the zones begins with use of common Geographic Information System (GIS) software to assign an index number to each 5-kilometer cell in a grid laid out across the contiguous 48 States. The “population interaction index” (PII) measures the influence that nearby population exerts on agricultural land in each grid cell. Each PII is a continuous measure that accounts for both population size in all grid cells within a 50-mile radius and their distance from the target grid cell. The index increases as population increases, and/or as distance between agricultural land and that population decreases.

In order to assign cells to either a “rural” zone or a “population interaction” zone, thresholds for PII were established for each of 20 Land Resource Regions (LRRs) defined by USDA’s Natural Resources Conservation Service. Thresholds were established near the upper end of the range of index numbers for grid cells in the most rural census tracts of each LRR. Within each LRR, index numbers below that threshold represent rural levels of population interaction, which exist even in the absence of urban-related population interaction. Any grid cell whose index exceeds the threshold is classified into a “population interaction zone.” Cells initially classified into the population interac-

Population interaction zones, 2000



Source: ERS analysis of 2000 census of population block data.

tion zone are further classified into one of three categories, yielding a four-level classification: rural (little or no urban-related population interaction) and low, medium, and high population interaction.

The indices (PII) and zone codes (PIZA), which can be used to classify any geographic point in the 48 contiguous States, are available on the ERS website. GIS software is necessary, however, to retrieve the indexes and zone codes and relate them to any given geographic point.

Charles Barnard

Contact: Vince Breneman, breneman@ers.usda.gov

For more information...

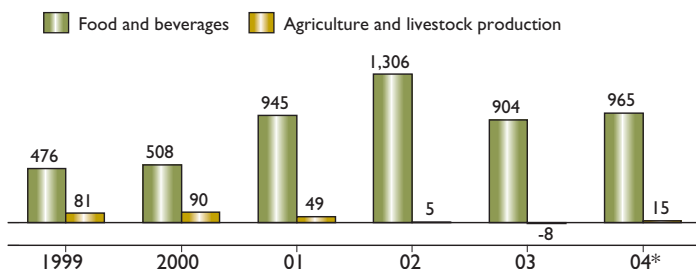
Measuring Interactions Between Urban-Related Population and Agricultural Production Activities: www.ers.usda.gov/briefing/landuse/measuringurbanchapter.htm

See also the ERS Population Interaction Zones for Agriculture (PIZA), at: www.ers.usda.gov/data/populationinteractionzones/

Markets and Trade

Mexico's food and beverage industries attract substantially higher net inflows of foreign direct investment than production agriculture

Investment (\$ millions)

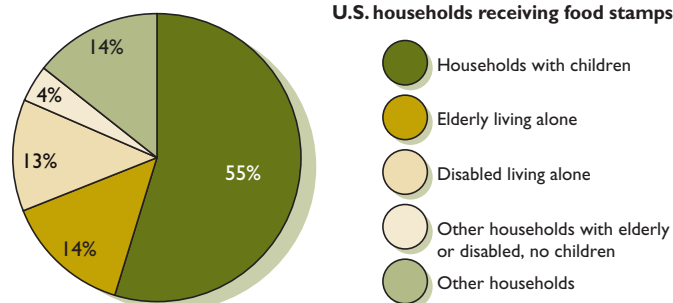


*January-September 2004.

Source: ERS calculations, based on data from Mexican Secretariat of Economy, General Directorate of Foreign Investment.

Diet and Health

About 86 percent of the almost 9 million households that received food stamps in FY 2003 had at least one child, elderly person, or disabled person

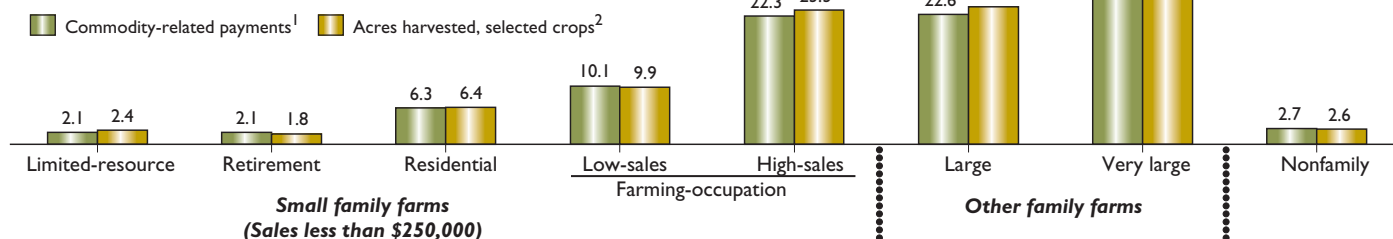


Source: Prepared by ERS using data from USDA's Food and Nutrition Service.

Farms, Firms, and Households

Acres of program commodities help explain the distribution of commodity program payments, 2003

Percent of U.S. total



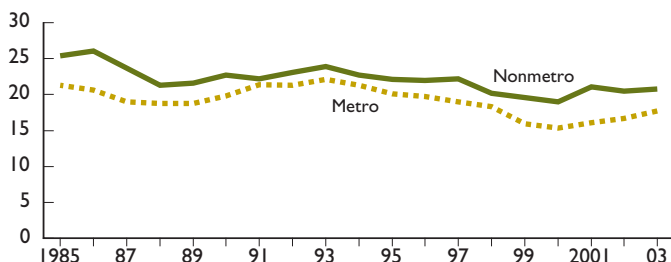
¹Direct payments, countercyclical payments, loan deficiency payments, marketing loan gains, and other payments. ²Food and feed grains, soybeans, other oilseeds, sugar beets, and sugarcane.

Source: USDA's 2003 Agricultural Resource Management Survey, Phase III.

Rural America

The metro-nonmetro gap in child poverty rates narrowed in the 1990s but widened again in the early 2000s

Percent in poverty

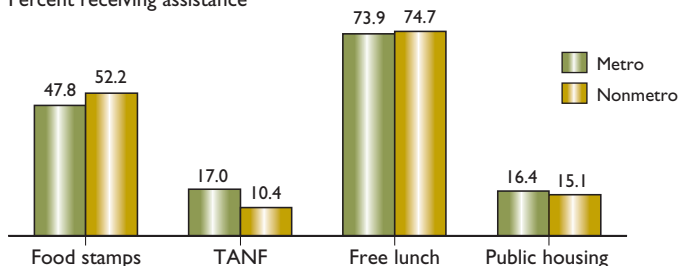


Note: Child poverty rates are based on children under age 18 in families.

Source: Calculated by ERS from Current Population Survey data files, 1986-2004.

Higher shares of nonmetro poor children receive food stamps than metro children, 2004

Percent receiving assistance



Note: Households must meet a low-income threshold to qualify for food stamps, Temporary Assistance for Needy Families (TANF), and free or reduced-price lunches.

Source: Calculated by ERS from the March 2004 Current Population Survey.

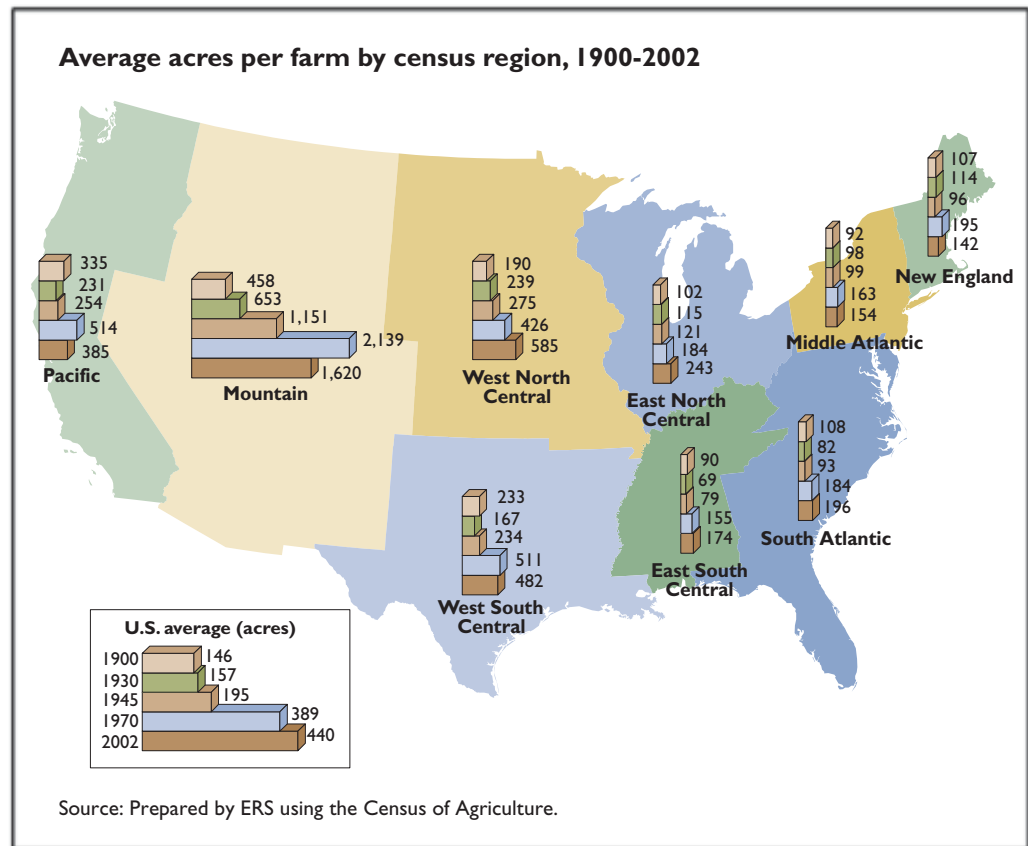
On the Map

Average farm size grows most rapidly in mountain States

Average farm size in the U.S. has increased fairly steadily over the last century, but growth patterns vary by region and time periods. Snapshots of regional average farm size at five points in time (see “Milestones in U.S. Farming and Farm Policy” on page 10) illustrate a more complex picture of changing farm size in the U.S. than is apparent in national averages.

Carolyn Dimitri,
cdimitri@ers.usda.gov

Anne Effland,
aeffland@ers.usda.gov

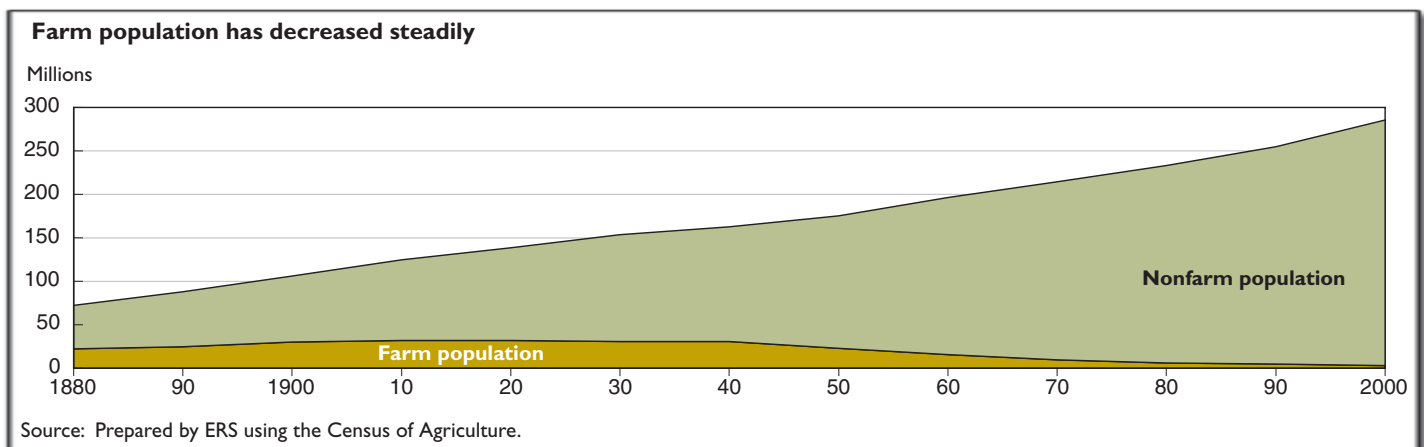


In the Long Run

Farm population as a share of total U.S. population

Farm population has fallen steadily as a share of total U.S. population for more than a century. Less than half the U.S. population has lived on farms since these data were first collected in 1880.

Carolyn Dimitri, cdimitri@ers.usda.gov
Anne Effland, aeffland@ers.usda.gov



Current Activities

ERS Research on Biotech Crops Informs Policies Abroad

The rate at which U.S. farmers have adopted biotech crop varieties has increased dramatically over the past 9 years. ERS research has shown that U.S. farmers are realizing tangible economic benefits from adopting these crops, such as higher yields, savings in management time, and lower pesticide costs. These and other research findings are of particular interest to countries that are designing policies related to biotech crop production and use. Recently, a delegation of senior policymakers from Turkey, hosted by USDA's Foreign Agricultural Service, met

with ERS economists Jorge Fernandez-Cornejo and Bill Lin to learn about the economic issues related to the adoption of biotech crops by U.S. farmers. The delegation is developing new biosafety legislation for Turkey. **Jorge Fernandez-Cornejo**, jorgef@ers.usda.gov

Diverse Labor Force Attracts New Food Processing Plants

As the manufacturing sector's share of total U.S. employment continues its historic decline, rural areas face increasingly stiff competition—from both urban and rural areas—in attracting new manufacturing plants. Thus, rural county economic planners have a keen interest in the traits of counties that have successfully



attracted new manufacturing plant investment. Preliminary ERS research shows that the diversity of the labor force, whether measured by income, educational attainment, or occupation, was associated with a higher likelihood of a county's being chosen as a site for new food processing plants. This finding was true for all counties—urban, suburban, or rural. While true for all counties, the typically more diverse urban and suburban labor forces favor nonrural counties. **Gerald Schluter**, schluter@ers.usda.gov, and **David Davis**, ddavis@ers.usda.gov

Recent Meetings

Rapid Spread of Supermarkets Changing the Pacific Rim Food System

In May 2005, ERS, the Farm Foundation, and the Pacific Economic Cooperation Council convened a conference in Kunming, China. Conference participants from the public sector, food companies, and academic institutions in 16 Asia-Pacific countries assessed the changing structure of the retail food sector and its impact on the region's agriculture and trade. While growth in the retail share of supermarkets in developed countries spanned many years, the pace has accelerated in middle-income countries like China, Mexico, and Indonesia. In these rapidly urbanizing markets, consumers are benefiting from lower prices from

economies of scale in procurement and distribution and the private enforcement of higher food safety standards. On the other hand, small "mom and pop" shops and wet markets are facing adjustment pressure as are small farmers. Policymakers are looking for ways to enable small producers to compete in a supermarket world by facilitating farm and farmland consolidation and the shift of resources into more remunerative niche activities. **William Coyle**, wcoyle@ers.usda.gov

Policy and Competition in a Changing Global Food Industry

In April 2005, ERS, jointly with the Farm Foundation, Pennsylvania State University, and the International Food and

Agribusiness Management Association, hosted a conference on "Policy and Competitiveness in a Changing Global Food Industry." This conference brought together researchers, business people, and policymakers to engage in a structured open discussion on major issues regarding policy and business competitiveness in a rapidly changing global food economy. Discussions focused on factors impacting the competitiveness of food firms, the role of evolving food supply chains on food trade flows, and the role of policy in a global industry dominated by multinational players operating across national boundaries. Conference papers are available at: www.farmfoundation.org. **Anita Regmi**, aregmi@ers.usda.gov

New Releases

A Redesigned Data Portal

ERS is a major source of agricultural economic data, with almost 40,000 unique visitors accessing ERS data online each month. Approximately one-quarter of these visitors find the data they seek by navigating from ERS's data portal, www.ers.usda.gov/data/. ERS recently redesigned and relaunched its data portal

with an improved layout to help visitors explore ERS's large collection of data products more easily. Users can now browse data products by commodity, geographical region, and topic and can more easily access ERS's most requested data and new data products. In addition, key indicators, a calendar of releases, and a signup for notification of new releases are featured prominently in the new layout.

Rural America's Children

Rural Children At A Glance (EIB-1), the latest in a series of ERS reports on social and economic conditions in rural areas, provides recent information on the demographic, social, and economic status of rural children in families. This six-page brochure charts trends in racial/ethnic composition and living arrangements of



children as well as poverty and other indicators of child well-being. Although rural child poverty rates declined in the 1990s, they remain higher than the rates of urban children. The monitoring of increases in child poverty and the changing geographic distribution of poor children can be used in targeting poverty reduction policies and program assistance, such as child nutrition programs, food stamps, and health insurance coverage in rural areas. **Carolyn Rogers**, crogers@ers.usda.gov



North American Agricultural Policies Compared

A new ERS report, *Recent Agricultural Policy Reforms in North America* (WRS-05-03), examines the significant changes that the U.S., Mexico, and Canada have each made to their agricultural policies over the past several years. In the area of income supports, each country has instituted a countercyclical program that provides additional assistance to producers during downturns in commodity prices, and each continues to decouple key support programs from production decisions. In other areas, the reforms of the three countries have different points of emphasis. **Steven Zahniser**, zahniser@ers.usda.gov

China's Agricultural Imports Rising

A new ERS report, *China's Agricultural Imports Boomed During 2003-04* (WRS-05-04), indicates that China's agricultural imports more than doubled between 2002 and 2004, due to surging demand for basic commodities, a more open trade regime, and tighter commodity supplies in the Chinese domestic market. Soy oil, palm oil, and raw soybeans

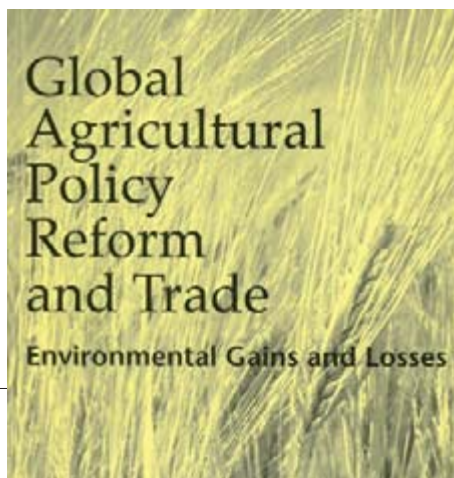
crushed to make cooking oil together accounted for nearly half of import growth. Industrial raw materials—cotton, leather, and rubber—accounted for an additional one-third of the dollar value of agricultural import growth. U.S. agricultural exports to China jumped to a record \$5.5 billion in 2004. China's agricultural exports continued to climb as well, but at a rate slower than its growth in imports. **Fred Gale**, fgale@ers.usda.gov

Commuting Codes Updated

Using data from the 2000 decennial census, ERS recently updated its rural-urban commuting area (RUCA) codes, a detailed and flexible scheme for delineating sub-county components of the U.S. settlement system (www.ers.usda.gov/data/ruralurbancommutingareacodes/). RUCA codes classify U.S. census tracts using measures of population density, urbanization, and daily commuting. They are based on the same concepts used by the Office of Management and Budget to define county-level metropolitan and micropolitan areas. However, the use of census tracts instead of counties as building blocks for RUCA codes provides a different and more detailed geographic pattern of settlement classification. **John Cromartie**, jbc@ers.usda.gov

Agricultural Trade and the Environment

The World Trade Organization's efforts to liberalize agricultural trade have raised concerns that the current movement toward globalization fails to adequately address environmental issues. A timely new book edited by ERS economist Joseph Cooper analyzes the possible linkages between agricultural trade liberalization and the environment. *Global Agricultural Policy Reform and Trade*



Environmental Gains and Losses (Edward Elgar, Cheltenham, UK, and Northampton, MA, US, 2005) also assesses the negative and positive impacts of possible policy reforms. **Joseph Cooper**, jcooper@ers.usda.gov



Many Forces Reshaping Global Textile and Cotton Markets

The phaseout of the Multifiber Arrangement (MFA) and other forces are reshaping world textile and cotton markets. The elimination of the MFA is helping reduce clothing prices in the United States and the European Union and shifting industrial demand for cotton to China, India, and Pakistan. At the same time, world cotton consumption has accelerated along with economic growth since 1999, especially in developing Asia, where an emerging consumer society is driving increases in consumption of clothing and other cotton products. A new ERS report, *The Forces Shaping World Cotton Consumption After the Multifiber Arrangement* (CWS-05c-01), finds that, in the long run, income growth and technical change have more of an effect on world cotton consumption than the elimination of the MFA. **Stephen MacDonald**, stephenm@ers.usda.gov and **Thomas Vollrath**, thomasv@ers.usda.gov

Commodity Markets and Trade

ERS Outlook reports provide timely analysis of major commodity markets and trade, including special reports on hot topics. All reports are available electronically and can be found at www.ers.usda.gov/publications/outlook/ along with a calendar of future releases. **Joy Harwood**, jharwood@ers.usda.gov

The citations here and in the rest of this edition are just a sample of the latest releases from ERS. For a complete list of all new ERS releases, view the calendar on the ERS website: www.ers.usda.gov/calendar/



The Helios Awards are designed to recognize excellent achievements in three major areas: Research and Policy Contribution, Communication Excellence, and Program Effectiveness. These new ERS awards are given at the agency level, not by organizational unit or subject area. Thus, the awards highlight not only the breadth of the ERS research program, but also the diversity of communication tools through which ERS disseminates research results. Distinguished judges from outside ERS reviewed the nominations and made the final decisions. The winning teams, shown here, received their awards at a special ceremony in April. ERS congratulates the winners and the many other ERS staffers who supported these award-winning projects.

Research & Policy Contribution

Winner



(l to r): Daniel Hellerstein, David McGranahan, Michael Roberts, Patrick Sullivan, Stephen Vogel, Ruben Lubowski

Conservation Reserve Program Study Team

In response to a request from Congress, this team explored the economic impacts of USDA's Conservation Reserve Program. Their findings were published in *The Conservation Reserve Program: Economic Implications for Rural America* (www.ers.usda.gov/publications/aer834/).

Honorable Mention



(l to r): Noel Gollehon, Jean Agapoff, Marc Ribaud, Vince Breneman, Marcel Aillery, and Rob Johansson; Not shown: Lee Christensen, Jonathan Kaplan, and Mark Peters

Animal Waste Management Team

Profiled in *Amber Waves* in September 2004, this team has conducted innovative and timely analysis of the policy options associated with animal waste management in such reports as: *Manure Management for Water Quality: Costs to Animal Feeding Operations of Applying Manure Nutrients to Land* (www.ers.usda.gov/publications/aer824/) and *Confined Animal Production and Manure Nutrients* (www.ers.usda.gov/publications/aib771/).